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AMONG U.S. MARINES DEPLOYED
TO OKINAWA, JAPAN

by
James S. Neville

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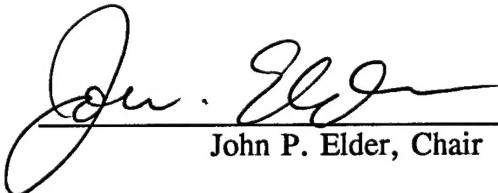
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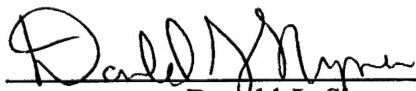
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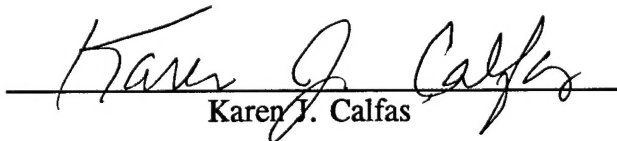


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TABLE OF CONTENTS

	PAGE
ACKNOWLEDGMENTS	iii
LIST OF TABLES	vii
LIST OF FIGURES	ix
CHAPTER	
I. INTRODUCTION	1
Background of the Problem	2
Purpose of the Study	4
Significance of the Study	5
Basic Assumptions	6
Heavy Use of Alcohol	6
Self-Reported Alcohol Use	8
Alcohol Content Within Beverages	8
Definitions	9
Hypothesis	12
II. LITERATURE REVIEW	13
Introduction	13
Prevalence of Heavy Alcohol Use	14
Economic Impact of Alcohol Abuse	18

CHAPTER	PAGE
II. (continued)	
Alcohol Use Among Young Adults	19
Alcohol Use in the U.S. Military	20
Adverse Effects of Alcohol Use	24
Summary	25
III. METHODOLOGY	26
Study Design	26
Population Sampled	26
Original Data Collection	28
Variable Development and Selection	28
Statistical Analysis	32
Data Limitations	33
IV. RESULTS	35
Introduction	35
Descriptive Data	36
Sample Characteristics	36
Total Alcohol Consumption	40
Battalion Variables	44
Outcome Variable Analysis	46
Serious Consequences	46
Productivity Loss	50

CHAPTER	PAGE
VI. (continued)	
Symptoms of Dependence	56
V. DISCUSSION	62
Review of Current Findings	62
Comparison of Prevalence With Other Studies Reported in the Literature	66
Recommendations	67
Limitations of the Current Study	68
Recommendations for Future Research	70
Conclusion	72
REFERENCES	73
APPENDICES	
A. 1997 SURVEY OF HEALTH-RELATED BEHAVIORS AMONG U.S. MARINE CORPS PERSONNEL	77
B. VARIABLE DESCRIPTIONS	100
C. HP 2000 ALCOHOL-RELATED TARGET AREAS	103
ABSTRACT	105

LIST OF TABLES

TABLE	PAGE
1. Drinking Pattern Categories	12
2. Other Drug Use in the Past 12 Months	37
3. Sample Characteristics	38
4. Drinks Consumed Over the Prior 30 Days, by Consumption Pattern	41
5. Comparison of Mean Alcohol Consumption (Log Transformation) Within Selected Demographics, Abstainers Excluded	42
6. Univariate Linear Regression Analysis for Continuous Variables and Log of Total Consumption	44
7. Influence of Battalion Assignment on Selected Variables	45
8. Univariate Analysis for "Serious Consequences on Okinawa" (Alcohol Abstainers Excluded)	47
9. Multivariate Logistic Regression Analysis for "Serious Consequences"	49
10. Relationship Between Alcohol Consumption Category and "Serious Consequences on Okinawa" (Excluding Abstainers), Controlling for Battalion and Family History of Alcohol Abuse	51
11. Univariate Analysis for Productivity Loss on Okinawa Abuse (Alcohol Abstainers Excluded)	52
12. Multivariate Logistic Analysis for Productivity Loss	54

TABLE

PAGE

13.	Relationship Between Consumption Category and "Productivity Loss on Okinawa," Controlling for Race and Family History of Alcohol Abuse	55
14.	Univariate Analysis for Dependence Symptoms on Okinawa (Alcohol Abstainers Excluded)	57
15.	Multivariate Analysis for "Dependence Symptoms"	60
16.	Relationship Between Consumption Category and "Dependence Symptoms on Okinawa," Controlling for Battalion, Years of Active Duty, and Family History of Alcohol Abuse	61

LIST OF FIGURES

FIGURE	PAGE
1. Prevalence of Any Use of Alcohol in the Past 30 Days and 2-Week Consumption of 5 or More Drinks in a Row by Age	15
2. Prevalence of Heavy Alcohol Use by Year and Service, All Ages Included; Rates Adjusted for Sociodemographic Factors	22
3. Alcohol Consumption Among Drinkers, Measured in Total Drinks Over the Previous 30 Days	41

CHAPTER I

INTRODUCTION

Heavy use of alcohol is a well-known risk factor for adverse outcomes in both personal and societal health. For 1995, the estimated economic costs of alcohol abuse in the United States amounted to over \$166 billion (National Institute on Drug Abuse, 1998). Alcohol-related goals constitute almost an entire priority area for Healthy People 2000 (Public Health Service, 1991). At the individual level, excessive alcohol consumption has serious negative immediate and long-term impacts on the lives and interpersonal relationships of those who indulge. This paper describes the results of an effort to document the extent of alcohol use and associated selected adverse consequences in a specific population: U. S. Marines on temporary deployment to Okinawa, Japan.

The history of the United States Marine Corps (USMC) spans over 200 years, starting with its Revolutionary War-era establishment by the Second Continental Congress. During the winter of 1775-76, General George Washington began recruiting for the newly authorized Marine Corps in Philadelphia, Pennsylvania. Soon the recruiting effort centered at Philadelphia's Tun Tavern, the owner himself eventually becoming a Marine officer (Krulak, 1984). The USMC's current social tradition and culture is rooted in the history of the Corps, including its tavern-centered early genesis. Whether the tavern reflects an

important historical venue or merely a folkloric embellishment, it serves as a convenient pretext for alcohol's prominent place in the entertainment choices of the typical Marine. U.S. Marines are internationally renowned not only for their impressive combat skills, but unfortunately also for their historically impressive alcohol use.

Background of the Problem

U.S. Marines deployed to Okinawa for temporary duty have anecdotally been known throughout the Corps to drink alcohol more heavily than other groups of Marines. These deployed Marines constitute our nation's mobile, forward-deployed, combat-ready combined arms troops, one "point of the spear" for the vast Pacific Theater. Factors that degrade the readiness of these military forces require elucidation and remediation, if possible. Adverse consequences attributed to excessive alcohol consumption can have a major negative influence on military readiness: family discord, injuries or illnesses, and Uniform Code of Military Justice (UCMJ) punishment actions keep Marines from peak performance.

The smallest complete, self-supporting and functional Marine combat unit is the battalion. Each battalion consists of approximately 900 Marines assigned to a number of subordinate combat and support companies. Current national defense planning calls for 4 battalions of Marines to be forward deployed and on alert at any one time. These battalions are sent from home bases in the Continental United States (CONUS) and Hawaii to forward locations in either the Pacific or the

Atlantic for six-month deployments. Every 6 weeks or so a different battalion replaces the battalion just finishing its deployment. During the deployment, Marines are "on call" to national command authorities; hence the self-proclaimed moniker "America's 911 Force." At the end of the 6-month deployment, the battalion returns to its home base where usual training schedules and everyday life resumes. These deployments are a part of Marine Corps life and have been going on in about the same format for about 15 years. The two Marine Corps bases on Okinawa are Camp Hansen and Camp Schwab; battalions rotating to the Pacific are randomly assigned to one of these two locations, based on logistical factors.

The commanders of these battalions bear full responsibility for the conduct of training and discipline within their battalion. In general, the battalion moves to and from Okinawa as a unit, but there are inevitable variations based on an individual Marine's needs, such as other training or assignments and significant illness or injury, hence the time on station for battalion members is not always the same. Application of disciplinary measures is generally determined by each battalion's command structure, within Corps-wide guidelines and procedures. Wide variation in the application of discipline is possible between battalions, although one would expect uniform application within a given battalion.

The deployments are stressful events for a number of reasons. Marines are taken away from their homes, families, or familiar surroundings and are placed in an unfamiliar setting, with the constant threat of being called on to engage in dangerous operations. Most of the workday often is spent in physically demanding

training. During portions of their deployments, these Marines are aboard Navy ships "afloat," awaiting potential orders to intercede in any number of scenarios, from actual combat as in the Gulf War of 1990-91, to peacekeeping missions, embassy evacuations, and humanitarian relief operations. The wide variety of potential duties, the inherent danger they entail, and the long periods of uncertainty while waiting for something to happen all contribute to the unique stress of these deployments.

Factors unique to this study population include the temporary and displaced nature of their life environment, the prominence and expectations of their traditions, and the regular turnover of the individuals comprising the subject group. In addition, the new freedoms and responsibilities marking major developmental roles of most members of the target population imply a level of autonomy of personal behavior that makes designing interventions a very complex issue.

Purpose of the Study

Excessive alcohol consumption among deployed Marines on Okinawa has been anecdotally observed and reported. The survey reported here was conducted to document the extent of alcohol use and associated adverse consequences among this special population. The need for prevention programs to be tailored to the cultural, developmental, and geographic needs of the target population is increasingly being recognized (Public Health Service, 1997). The results were

intended to verify or debunk the traditional perception of excessive alcohol consumption among this group of Marines, as well as provide information for decision-makers regarding the need for possible new interventions designed to reduce consumption of alcohol.

Significance of the Study

Several surveys of alcohol and other drug use have been conducted within the Department of Defense (DOD) and have been reported by branch of uniformed service in aggregate. These studies were not designed for evaluation of alcohol and other drug use on smaller subunits of the studied populations, such as individual military bases or similar geographic regions (R. M. Bray, personal communication, September 23, 1998). The smallest geographic division that the researchers felt had sufficient statistical power was stateside (CONUS) versus overseas (OCNUS) locations in aggregate. Because of this limitation, populations or environments that contribute more heavily to the adverse findings are not identifiable. Anecdotal information identified the deployed population of Marines on Okinawa as a population that consistently consumed much more than the mean, a group which deserved closer scrutiny. This study can be used to inform researchers and military commanders of the extent of heavy alcohol use on Okinawa. An indirect comparison can be made to the drinking behavior of the USMC as a whole. In addition, this study could serve as an example of the need

for determining higher risk subgroups within the armed forces, subgroups which in turn represent fertile ground for effective interventions.

Basic Assumptions

The focus of this paper is the evaluation of alcohol use among Marines deployed to Okinawa. Because this paper is not intended as a thorough review of alcohol use itself, the following basic assumptions are presented.

Heavy Use of Alcohol

Heavy use of alcohol is not desirable. That this statement is listed as an assumption may seem strange, but the idea that these Marines should, in whatever way is deemed appropriate, reduce their alcohol consumption is not uniformly accepted as a valid need. There are those within the USMC who sincerely feel that as long as their Marines are drinking within the confines of their barracks and not causing national or international embarrassment (or embarrassment to the Corps), their drinking should not be restricted, especially in a forward deployed location like Okinawa. Military law clearly spells out a series of consequences if alcohol use results in damage to property or other persons, so as long as these bounds are maintained, let them drink! Several superficially plausible factors underlying this argument are summarized below. These sentiments derive from informal conversations and by no means represent official policy.

1. Marines are volunteers, employed and expected by their nation to be ready to lay down their lives in combat. In assuming that an individual can make the decision to join a force whose primary objective is to destroy things and kill people, one should also assume that those individuals also are capable, or should at least be allowed the privilege, of deciding their extent of legal alcohol use. They should be allowed to choose the recreation of their choice, to the limits defined in the laws and regulations which delineate the consequences should harm come to property or other people as a result of drinking behavior.

2. Marines live a stressful life, especially while deployed. Their regular workday is spent in physically demanding training, often long marches with heavy equipment. They should be allowed to "blow off steam" by drinking if they choose, as long as no harm comes to others as a result. Many will choose not to engage in physical recreation on their time off. If alcohol helps them relax, especially in the controlled environment of their barracks, then there is no real harm.

3. Most young adults go through a stage of excessive alcohol use only to decrease their consumption to a more acceptable level as they get older (this sentiment is corroborated by data in Johnston, Malley, & Bachman, 1996). The duration of the Okinawa deployments is relatively short, only six months. If alcohol serves as a temporary crutch that helps manage the stresses of deployment, no harm done.

4. Many Marines drink excessively in Okinawa primarily to help the time pass more quickly. Some Marines intentionally drink themselves into a stupor precisely so that they can wake up many hours later or the next day, that much closer to returning home. Why interfere with this legal way of coping, so long as no harm comes to others and the behavior seems for the most part transient?

5. Those individuals who join the all-volunteer USMC are inclined to be risk takers. The USMC wants risk takers, because the whole purpose of the USMC is to expose itself to risks in support of national military objectives, risks other people are unwilling to take. An externally applied restriction on alcohol consumption is a cut against the grain of the typical Corps recruit.

Self-Reported Alcohol Use

Self-report alcohol use reflects actual consumption patterns. The survey depends on anonymous self-report of substance use patterns and associated negative effects. Embree and Whitehead (1993), in a review of studies assessing the reliability and validity of self-reports of alcohol use, found that these kinds of studies are generally highly reliable and valid.

Alcohol Content Within Beverages

Alcohol content within the different beverage categories is considered to be equal. Although alcohol content differs by brand and by type of beverage, for purposes of this analysis, all beers are considered to contain equivalent alcohol

concentrations of 4% by weight. All regular wines are considered to have equivalent alcohol concentrations of 12% by weight, fortified wines 18% by weight, and wine coolers 4% by weight. All liquor is considered to have equivalent alcohol concentrations of 48% by weight. Thus, equivalent drinks are considered to be 12 ounces of beer, 4 ounces of regular wine, and (conservatively) 1.0 ounce of liquor (Grossman, 1983; U.S. Department of Health and Human Services, 1997).

Definitions

Abstainer: One who reports no alcohol use in the past 30 days. The DOD survey includes those who report only one drink in the past year, however, the survey used for this study asks for alcohol use in the past 30 days (Bray et al., 1995).

Binge drinking: Consumption of 5 or more drinks on a single drinking occasion. The time frame under question is generally specified separately, such as over a two-week period or over the past year.

Recently some have advocated changing the term “binge drinking” to “high risk drinking,” a term that more accurately describes the risk of adverse consequences associated with that level of drinking (DeJong, 1998).

Heavy drinking: This is a difficult concept to precisely define, and there is no well-accepted consensus in the literature. The classification depends on the

amount a person drinks on each drinking occasion as well as the frequency of consumption. For purposes of this paper, "heavy" drinkers are those who drink at least once a week and consume five or more drinks per typical drinking occasion. However, a person who consumes four drinks at a time every day of the week would not be classified as a heavy drinker.

Excessive alcohol consumption: For the purposes of this paper, any alcohol consumption episode or pattern that leads to any adverse effects or outcomes, whether acute or chronic, is considered excessive.

Standard drink: For the purposes of this analysis, a standard drink contains about 12 grams of ethanol and is equivalent to 12 ounces of beer, 4 ounces of wine, and 1.0 ounce of hard liquor. Beers contain 3-6%, wines contain 12-14 %, fortified wines contain 18-20%, wine coolers contain 4-7%, and liquor contains 40-50% ethanol by volume (Grossman, 1983). Since alcohol content varies within the drink classifications, the total alcohol consumption variables in this paper are useful for comparison and should not be construed as absolute accurate values.

Paygrade: The military rank structure is divided into officers, abbreviated "O," and enlisted, abbreviated "E." These letters are followed by a numeral designating increasing rank that comes with promotions. E1 is the lowest enlisted

grade; E9 is the highest. This survey includes respondents in the paygrades E1 through E6 only.

Uniform Code of Military Justice (UCMJ): Formal legal code of laws and regulations applying to uniformed service personnel only. Laws and punishments differ from civilian laws in important ways, which are beyond the scope of this paper.

Court Martial: Formal legal proceedings against military members conducted under the Uniform Code of Military Justice. These proceedings are analogous to civilian court proceedings.

Drinking pattern categories: Forcing patterns of alcohol consumption into discrete categories is problematic for two reasons. First, consumption patterns of an individual may change over time. Second, the reported consumption pattern for different types of beverages may differ. These definitions, outlined in Table 1, are adapted from the DOD worldwide survey (Bray et al., 1992), and are generally consistent with definitions used in the literature. For purposes of this paper, an individual was classified in the highest consumption pattern described by any of his drinking habits. Consumption habits in each beverage category were counted as separate drinking episodes, but the category designation was not increased by adding beverage categories. In other words, if an individual reported consuming 5 beers 3 times in the past 30 days plus 5 glasses of wine once, that individual was

classified as a “moderately heavy” drinker, even though he well may have binged 4 times and could be a “heavy” drinker. There is no way to make that distinction from the data. Because this method required a judgment on what the data actually represent, the categorizations should be interpreted with caution.

Table 1

Drinking Pattern Categories

	Episodes per month	Drinks per episode
Abstainers	0	
Infrequent/light	1-3	1-4
Moderate	≥ 4	1
	≤ 1	≥ 5
Moderate heavy	≥ 4	2-4
	2-3	≥ 5
Heavy	≥ 4	≥ 5

Note. The DOD survey defines abstainers as those who report ≤ 1 drink per year.

Hypothesis

Among Marines deployed to Okinawa, heavy use of alcohol is associated with increased risk of both personal and administrative adverse consequences on Okinawa.

CHAPTER II

LITERATURE REVIEW

Introduction

Consumption of alcoholic beverages is a common component of recreation, relaxation, and/or dietary habits throughout the world. Indeed, there is strong evidence for beneficial health effects of moderate alcohol consumption (Sacco et. al., 1998; Criqui & Ringel, 1994; Dufour, 1996). Excessive alcohol consumption, on the other hand, has long been recognized as a major national and international health problem. Despite this general acceptance of the problems of excessive alcohol consumption, there remains no accepted precise cutoff defining excessive use for individuals or for populations. Classification of a person's or society's alcohol consumption level as "excessive" is defined somewhat arbitrarily, generally based on levels associated with increasing adverse effects and consequences.

Alcohol use studies reported in the literature differ in terms of design, reporting of variables, and use of terms. These differences can make direct comparisons problematic.

Prevalence of Heavy Alcohol Use

The available published literature on alcohol consumption in the U.S. military is limited. Substantially more information is available on the similar age group of the general population, especially college students. College students represent a similar group in terms of age and gender, but in other ways may be quite different from military populations. Comparisons of drinking rates are useful for perspective but otherwise have limited utility.

Along with many smaller studies, three major studies on alcohol use in young adult populations have been or are being conducted (Meilman, Cashin, McKillip, & Presley, 1998). "Monitoring the Future" is a longitudinal study utilizing repetitive surveys to assess alcohol use patterns of students starting in their high school years and continuing into adulthood. The "Core Alcohol and Drug Survey" consists of compilations of data obtained from surveys which were designed to assist individual colleges and universities in evaluating alcohol and drug use on their campuses. The "College Alcohol Study" is a cross-sectional study of college students' alcohol and other drug use in 1993. These three studies used different methods, but only the summary results are reviewed briefly here.

The Monitoring the Future Study began in 1975 and has followed individual students into adulthood. The study describes alcohol use patterns starting in high school and continuing in a broad range of after-high school living situations, including but not limited to college (Johnston et al., 1996). Data from

this study show that prevalence of binge drinking (defined as five or more drinks in a row any time in the past two weeks) peaked at age 21-22 in 1995 (Figure 1). Binge drinking among college students was higher than the general population, reaching approximately 33% in female and 47% in male college students. Thirty-day prevalence of daily alcohol use by male college students was nearly double that of female college students (6% vs. 3%).

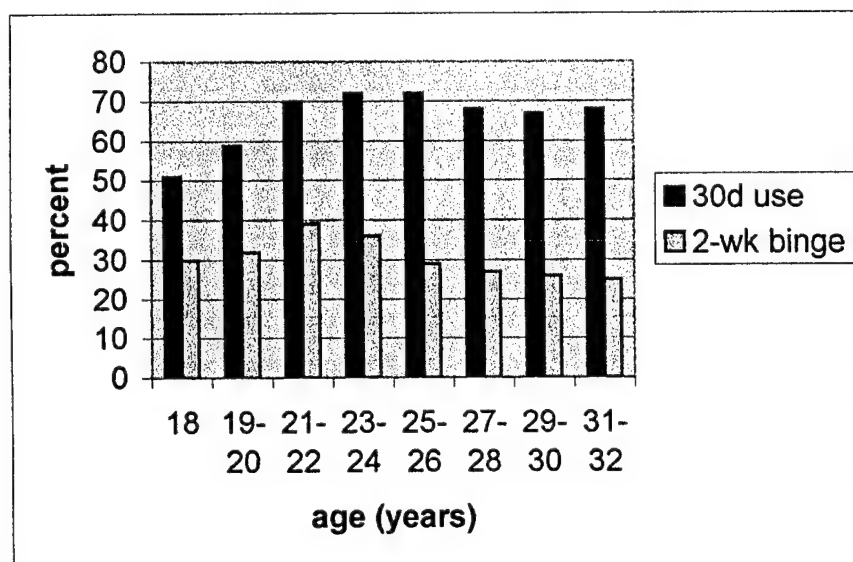


Figure 1. Prevalence of any use of alcohol in the past 30 days and 2-week consumption of 5 or more drinks in a row, by age (derived from Johnston, Malley, & Bachman, 1996).

In their analysis of the Monitoring the Future Study, Bachman and colleagues (1997) reported a number of interesting variables associated with

changes in prevalence of alcohol use. Alcohol use in general increased after high school, but the increases were dependent on several variables. The following variables were associated with the largest increases: full time student status, military service, part-time job, living arrangements other than marriage or cohabitation, single marital status, and transition from married to divorced. The one variable associated with the largest declines in alcohol use was pregnancy (or spouse pregnant). Multivariate controls did not appreciably change the positive relationship between military service after high school and increases in both 30-day alcohol use and heavy drinking.

The second major epidemiologic study on alcohol use has been coordinated by the Core Institute since 1989. This study, funded by the U.S. Department of Education, develops and coordinates alcohol and other drug use surveys on college campuses. The Core Institute publishes aggregated data from these surveys. A monograph of 1992-94 surveys indicated that 48.4% of males and 30.7% of females reported binge drinking (Presley, Meilman, & Cashin, 1995). During the 1995-96 school year, nearly 90,000 college students on 171 campuses were surveyed. The results showed that 41.7% of college students reported binge drinking, defined as having consumed five or more drinks in one sitting over the prior two weeks; a gender breakout is not available (Core Institute, 1997).

The College Alcohol Study is the third major national alcohol study among college students. A total of 17,592 students returned direct-mailed surveys (69% response rate), and among those respondents 50% of the males and 39% of

females were binge drinkers (Wechsler, Davenport, Dowdall, Moeykens, & Castillo, 1994). The prevalence of binge drinking varied widely among the surveyed institutions. Binge drinking was defined as reporting five or more drinks in a row over the past two weeks. This value for prevalence may be overestimated because seminary and allied health schools were excluded from the study. The authors analyzed adverse outcomes in nonbinge drinkers compared to infrequent and frequent binge drinkers and found significant associations with a number of alcohol-related problems. The adverse consequences studied are not directly comparable with the outcomes reported in this paper. The College Alcohol Study does help confirm, however, that increasing alcohol consumption is strongly associated with serious adverse consequences in young adult populations.

Midanik and Clark (1994) described drinking patterns of the general, noninstitutionalized U.S. adult population in a comparison of data from two separate national surveys conducted in 1984 and 1990. Heavy drinking, defined rather loosely as having five or more drinks on one occasion at least once a week during the previous year, occurred in 17.6% of 18- to 29-year-old males in 1984 and 11% in 1990. This compared to 6.2% and 3.9% in the general population in 1984 and 1990, respectively. Heavy drinking was associated with lower education, with a prevalence of 6.3% in those with less than a high school education compared to 3.8% for high school graduates, 3.1% for those with some college, and 1.8% for college graduates. Overall, the 1990 prevalence in males was 6.5% compared to 1.4% for females.

While individuals in all facets of society are potentially at risk, data described above indicates that excessive alcohol use is most prevalent in young adult, nonmarried males. Marines deployed to Okinawa fit this demographic picture.

Economic Impact of Alcohol Abuse

National direct and indirect health costs attributable to alcohol-related factors for 1990 were estimated at over \$98 billion (U.S. Department of Health and Human Services, 1997). Excessive alcohol consumption leads to an estimated 100,000 deaths annually in the U.S., a result of drunk driving, alcohol-related homicide and suicide, alcohol-related cancers, stroke, and other diseases (McGinnis & Foege, 1993). Because of the heavy national burden, the United States Department of Health and Human Services developed an extensive list of alcohol-related objectives, constituting practically an entire priority area of Healthy People 2000 (U.S. Department of Health and Human Services, 1991), (Appendix C).

Only one economic impact study in a specific military setting could be found, and this study was limited to direct costs of inpatient services. A compilation of fiscal year 1997 (FY97) inpatient care costs for the US Air Force active duty personnel found that the diagnosis-related group (DRG) with the highest number of bed-days was alcohol/drug dependence with rehabilitation therapy (Vector Research, Inc., 1998). This DRG accounted for 8,766 bed days

(12% of the year's total bed days for USAF active duty personnel) and an estimated hospitalization direct cost of \$2,105,300, representing 1.8% of the Air Force's FY97 total inpatient costs. This represents a significant drain on resources. Since the Air Force has the lowest alcohol drinking rates among the services, one can speculate that the treatment costs for the other services are at least as great.

Alcohol Use Among Young Adults

As noted above in Figure 1, both 30-day prevalence of any drinking and two-week prevalence of five or more drinks in a row peaks in the young adult ages of the early twenties. There is no single reason for excessive alcohol use and no simple explanation; complex factors such as a person's environment, interpersonal situations, and biologic factors are thought to influence that individual's choices regarding alcohol consumption (Flay, Phil, Patraitis, & Hu, 1995). There are, however, some general observations that help to clarify the dynamic forces shaping the drinking behaviors described in this paper.

Young adulthood is a time of new freedoms and new responsibilities (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997). Society allows more freedoms as one ages, such as driving and voting privileges and "legal" alcohol purchase by age 21. People of this age generally begin either earning their own livelihood or seriously planning for it by pursuing education. This transition frequently includes changes in living arrangements, removing

individuals from their previously more supervised environments. The years after high school bring increasing economic independence, where more personal decisions about expenditures are required.

Parallel to these new freedoms, there emerges a corresponding set of new responsibilities. As young adults become more autonomous and assume their economic role in society, personal decisions become less buffered by parents or others. Data from the Monitoring the Future Study indicated that factors involving increased personal economic responsibility tend to be associated with decreases in alcohol consumption (Bachman et al., 1997). For example, pregnancy in the family, married or cohabiting living status, and full time civilian employment all were associated with decreases in heavy use of alcohol. To the extent that these factors are not present, alcohol consumption, especially heavy consumption, generally increased over time in young adults.

Alcohol Use in the U.S. Military

The most extensive published study of military substance use is composed of a series of worldwide surveys conducted under contract from the DOD. Although these worldwide surveys have the limitations of self-reported questionnaires, the methods used are rigorous, with large sample sizes and random selection of subjects. Other studies, such as the Monitoring the Future Study (Bachman et al., 1997), have included military persons, but are not specifically designed to study military populations and have only small numbers of military

personnel in their study populations. Results in most studies are not reported in any more detail than "military," if military is included at all, so data on alcohol use in USMC cannot be obtained from these studies.

Since 1980, the U.S. Department of Defense has conducted surveys designed to assess the prevalence of alcohol use within the armed services every three to four years (Bray et al., 1995). These surveys show that the overall prevalence of heavy alcohol consumption peaked in the early to mid 1980s, then fell to a low by the early 1990s. Since then, alcohol consumption has risen somewhat, but has not attained the levels seen in the 1980s, except in the Marine Corps (Figure 2). These surveys have shown that members of the USMC consistently demonstrate heavier alcohol consumption compared to the other three armed services, with the USAF drinking the least by a significant margin.

The reasons for these shifts are not entirely known. One possible explanation was the evolution to an all-volunteer force (Bray et al., 1995). People who volunteer may be less likely to drink excessively or use illegal drugs than the earlier drafted population. However, subsequent data shows some trends toward increasing consumption since 1992, despite the continuation of the all-volunteer force. Whatever the reasons, the results of these worldwide surveys heighten the concern among policymakers and leaders.

Each of the Armed Services has developed and published regulations and administrative procedures for dealing with personnel who experience adverse alcohol-related incidents. In addition, each service has alcohol treatment facilities

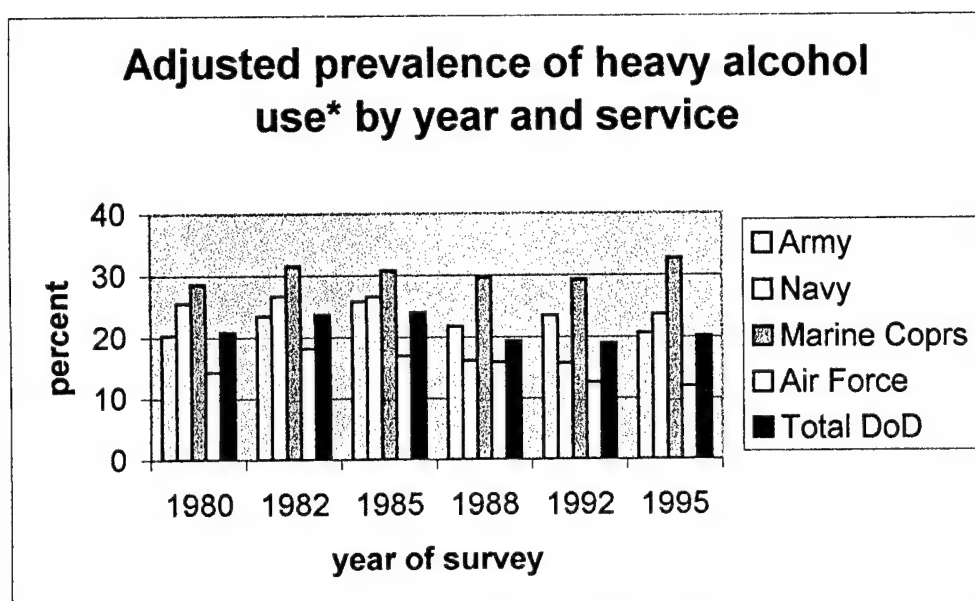


Figure 2. Prevalence of heavy alcohol use by year and service, all ages included; rates adjusted for sociodemographic factors. (Data compiled from the six world-wide surveys as reported in Bray et al. (1995).

*Heavy use defined as 5 or more drinks on one occasion at least once a week over the past 30 days.

available for active duty personnel and other beneficiaries. Programs range from alcohol counseling and education in a single session to inpatient rehabilitation units. These treatment facilities are no trivial matter. As noted above, the costs for these services are substantial.

Alcohol contributes to a significant proportion of active duty deaths and morbidities. A study of active duty U.S. Air Force deaths during 1985 indicated that 23% of the total deaths were attributable to alcohol-related causes, accounting

for approximately 2,300 years of potential life lost before 65 years of age (Stout, Parkinson, & Wolfe, 1993).

Comparisons of studies indicate higher alcohol use rates among military personnel compared to civilians. Bray and colleagues (Bray, Marsden, Peterson, 1991) compared data from their DOD survey to data from the 1994 National Household Survey on Drug Abuse (NHSDA). They reported the following rates of heavy alcohol drinking among 18-25 year old males (percent of population, with standard errors; civilian data standardized to U.S.-based DOD data by age, sex, education, race/ethnicity, and marital status): (a) civilian, 18.6(1.4); (b) Army, 28.1(2.6); (c) Marine, 38.2(2.4); (d) Navy, 30.4(2.1); and Air Force, 17.6(2.0).

It is clear from these data that Marines are heavy users of alcohol, heavier than all the other military branches. Surveys used to derive these data were not designed to evaluate specific subpopulations within the services, subpopulations that might weight the results toward the higher numbers. Specifically, the population of deployed Marines has not been studied by itself in the available published literature.

Bray and colleagues (1995) reported their results of a study of correlates of heavy alcohol use in the military. Within the military, prevalence of heavy drinking was higher in non-blacks, those with less education, younger age, not married or spouse not present, and lower pay grades. There was a trend for personnel stationed overseas to drink more, but the difference did not reach statistical significance.

Adverse Effects of Alcohol Use

Excessive alcohol consumption has well-documented immediate and distant adverse effects on individuals, their close personal contacts, and society at large. Immediate effects include consequences of acute intoxication with associated personal risk and are attributed to loss of inhibitions and motor control. For example, the National Highway Traffic Safety Administration (1998) estimated that 38.6% of 41,967 or 16,189 persons were killed in the U.S. during 1996 in alcohol-related vehicle crashes. A study of homicides in Omaha, Nebraska showed that 44.2% of the offenders and 35.6% of the victims were alcohol intoxicated (Clayton & Webb, 1991). Alcohol use was associated with 35.8% of suicides in a study of 515 suicides over a three-year period in Australia (Hayward, Zubrick, & Silburn, 1992).

Distant effects include pathologic changes due to chronic alcohol use. As reviewed in the Ninth Special Report to the U.S. Congress on Alcohol and Health (U.S. Department of Health and Human Services, 1997), alcohol has been shown to have adverse effects on the liver, gastrointestinal tract, heart, brain, and endocrine and immune systems. In addition, maternal alcohol consumption causes serious permanent adverse effects on the developing fetus. Prospective studies designed to follow individuals' alcohol use longitudinally have found evidence suggesting that psychiatric disorders such as depression and anxiety may develop in individuals as a consequence of alcoholism, not the other way around (Vaillant & Hiller-Sturmhoefer, 1996).

In college students, adverse effects of frequent binge drinking (defined as three or more binge episodes during the two weeks before the survey) included substantially higher risks of serious consequences compared to nonbinge drinkers. Frequent bingers had higher rates of getting hurt or injured (OR 10.4, 95% CI 8.7-12.5), not using protection during sex (OR 7.1, 95% CI 6.1-8.3), and damaging property (OR 9.5, 95% CI 7.9-11.4), among others (Wechsler et al., 1994).

Summary

Alcohol consumption in quantities considered excessive is highly prevalent, particularly among young adult, nonmarried males. Young adults are at particular risk because of their developing autonomy and freedoms. Members of the U.S. Military are not immune, particularly young, single males who make up the direct combat units of the USMC. Economic and social costs of alcohol abuse are considerable, both to society at large and to the armed services as well.

CHAPTER III

METHODOLOGY

Study Design

This investigation was designed as an anonymous cross-sectional study using a single self-administered survey developed by the staff of the Naval Health Research Center, San Diego, California. To facilitate comparisons, the survey items largely parallel the DOD-wide survey mentioned above (Bray et al., 1995). The survey consisted of 60 questions, most of which included multiple components. A copy of the survey is included in Appendix A. Few basic demographic information questions were included. The bulk of the survey concerned aspects of alcohol consumption, other drug and tobacco use, adverse consequences both in general and attributable to alcohol use, and attitudes toward alcohol use. There were no personally identifiable characteristics asked or recorded on the survey instrument; responses were entirely anonymous.

Use of the existing data was approved by the Committee on Protection of Human Subjects at San Diego State University.

Population Sampled

The survey was completed by a sample of 201 active duty U.S. Marines

while they were on deployment to Okinawa. Selection criteria for the survey population specified that each respondent had to be an active duty combat U.S. Marine, and each had to be serving on a temporary deployment in Okinawa at the time the survey was completed. Groups were selected from each of the two Marine Corps bases on Okinawa. The persons selected were members of Marine battalions who were available at the time the surveyors were in Okinawa.

The training schedule for Marines deployed to Okinawa is tightly packed and highly structured. By necessity, the groups selected to complete the survey did so at the pleasure of the respective commanders. The commanders of these groups allowed the surveyors the time needed for these Marines to complete the survey (45-60 minutes) and ensured that every Marine who was available at that time completed a survey. In that sense, the battalions represented a convenience sample, but the individual respondents represent a complete sample of those battalions available at the time the survey was conducted. There were no known individual selection parameters. Selection was not based on any known alcohol-related variable. Hence, the results represented an illustrative rather than statistically representative sample.

Based on anecdotal and direct observation of alcohol-related behavior on Okinawa by the survey staff, it was felt that the sample group reflects an accurate illustrative sample of male Marines on deployment to Okinawa.

Original Data Collection

The survey results represent a cross-sectional sample of Marines deployed to Okinawa during the summer of 1997. Each subject belonged to one of three battalions, and each completed a survey in one of three separate sittings in a base theater. Results were coded and entered into an electronic database by experienced research personnel of the Naval Health Research Center, San Diego, California. The database was examined for out-of-range values, which were corrected by referring to the original surveys.

Variable Development and Selection

The survey obtained data separately for beer, wine, and liquor. Total alcohol consumption was calculated by multiplying the following three variables for each type of alcohol: number of drinks on a typical drinking day, number of drinking days in the past 30 days, and volume of each typical drink (or type of beverage in the case of wine). The totals were summed for each individual, yielding a grand total monthly alcohol consumption. This technique for assessing total alcohol consumption is the same as that used by the National Institutes of Health (Williams, Clem, & Dufour, 1994). For purposes of the analysis, a natural logarithmic transformation of the total consumption was carried out. This new variable has a normal distribution as compared to the highly skewed untransformed total consumption variable. Alcohol consumption pattern categories were derived from the data based on the definitions shown in Table 1. Two

individuals reported alcohol consumption on all ten alcohol consumption items except the beer size item. Since 83% of beer drinkers in this sample reported drinking beer from 12-ounce cans, the 12-ounce size was entered for these two individuals. Similarly, one individual did not record his type of wine consumed, but did report all other wine consumption options; the "regular" wine type was entered for this individual.

The calculation of four individuals' total alcohol consumption may be an underestimate because data were missing from some fields. For example, one individual reported three days of drinking liquor in the past 30 days, but the number of drinks consumed and the size were not recorded, so that person's liquor contribution to total intake was counted as zero, probably underestimating the sum of his total alcohol consumption.

The outcome variables were compiled from responses to specific survey questions pertaining to adverse outcomes (see Appendix B). As in the DOD worldwide survey (Bray et al., 1995), three outcome variables were defined: dependence symptoms, productivity loss, and serious consequences. Cases coded as having missing data were not used in the analysis, unless the missing data could not cause a misclassification. For example, for the productivity loss variable, if any one of the criteria were reported, the individual was classified as having experienced productivity loss for this dichotomous variable, regardless of whether or not the other items defining productivity loss were left unanswered by the

individual. Cases were not included in a particular analysis if critical individual data were missing, such as age, paygrade, or race.

Particular note should be made about the definition of dependence symptoms used for this study. "Dependence" as used in this study does not correspond to DSM IV criteria. DSM IV includes consideration of behaviors such as increasing use over time to achieve the desired effect, time spent in activities necessary to obtain the substance, and others occurring in the same 12-month period (American Psychiatric Association, 1994). This clinical definition of dependence was found to have a prevalence of 3.9% among 19- to 29-year-old males of all races in data from the National Longitudinal Alcohol Epidemiologic Survey (Grant et al., 1994). The label "dependence symptoms" is used here, as in the DOD survey (Bray et al., 1995), to remind the reader that these are selected symptoms of dependence, not a diagnosis of dependence. The prevalence of these symptoms in the USMC reported by the 1995 DOD survey, 16.3% among E1-E3s and 7.3% among E4-E6s (ages not given), is much higher than that reported using the DSM IV definition. The difference is likely due to the definition discrepancy.

The survey examines adverse consequences over two different time periods: the past 30 days and the past 12 months. For purposes of this study, only those consequences occurring in the previous 30 days were examined because it was felt that these consequences would have a stronger impact on the operational mission of deployed Marines. Additionally, 12-month recall is likely to be more highly subject to recall bias than a 30-day recall.

The survey items used for the outcome variables asked for consequences “caused by drinking” or “because of my drinking.” To avoid bias from the wording of the question, the analysis for these variables excluded individuals who reported no alcohol consumption in the 30 days prior to the survey. The results of these survey items may not reflect reality for those who did not drink because, even if they had experienced one or more of the adverse consequences, they may have recorded zero adverse consequences since the consequences were not specifically due to alcohol use. If anything, this decision is likely to weaken the effect of the relationship between the outcome and independent variables.

Survey variables were chosen for inclusion in the analysis based on the literature and the nature of the variable distribution in the survey data. Demographic variables included age, race, educational level, battalion membership, marital status, and paygrade. Three items were used to represent family of origin or upbringing factors: age of first use of alcohol, family history of alcohol abuse, and family history of drug abuse. The distribution of many of the categorical independent variables contained small cell sizes, so these were consolidated into fewer categories (paygrade, educational status, race, marital status, weeks on leave). “Length of duty on Okinawa,” “years of active duty service,” and “weeks on leave over the previous 30 days” were chosen for inclusion because they have a theoretical impact on amount of alcohol consumed in this population.

The assigned camp on Okinawa was not used as an independent variable. There are only three battalions represented in this sample, only one of which was stationed at one of the camps. Any variation in outcomes by camp will be overcome by the battalion variable. Additionally, in accordance with the structure of USMC procedures, disciplinary actions are more dependent on battalion command factors than on Camp factors.

Statistical Analysis

Statistical analysis was performed using 1997 SPSS 7.5 and 8.0 software. Differences in demographic variables between groups were tested using the chi-square statistic for categorical comparisons and independent t-test for continuous variables. Regression models were constructed for each of the three outcome variables independently, following the same process for each variable. Logistic regression was used for both univariate and multivariate models. Multivariate models were constructed by first eliminating univariate variables with a significance greater than 0.10, then using a backward stepwise procedure using a removal alpha of .10. Once this model was constructed, selected interaction terms were tested for their significance and were kept in the model if significance was better than 0.05. An independent variable was considered significant in the final model if its p value was $\leq .05$ or if the 95% confidence interval did not include one.

Survey items were excluded from the analysis if more than 20% of the responses were missing or if more than 90% of the responses were the same. If there was greater than .7 correlation between variables, only one of the variables was used.

Each of the subject's adverse outcomes is assumed to be independent, such that one person's outcome has no influence on another person's outcome. It is possible, for example, that the actions of one member of a group of individuals may trigger legal proceedings for the entire group, where the actions of the other members of the group may not have triggered the consequence individually. For purposes of the statistical methods, however, each individual is assumed to be acting and experiencing outcomes independently.

Data Limitations

Because the individuals in the sample were not randomly selected, unknown selection biases may be present. It is possible that members of the selected companies were not available because they were otherwise occupied in other potentially alcohol-related events such as Alcoholics Anonymous meetings or disciplinary confinements. However, since the sample contains every member available at the time of the survey by direction of the commander, there are no individually determined selection factors.

Self-administered surveys are subject to recall bias. Since this was an anonymous survey, no attempt could be made to verify responses through other

means, such as medical or personnel record reviews. No attempt was made to verify reported alcohol consumption patterns or totals through other means. The possibility exists that some individuals may have either embellished or minimized their consumption, but there is no reason to suspect that there would be a bias favoring one direction or the other.

The survey described here is cross-sectional and represents the responses of those surveyed at the point in time the survey was done. The general subject population of deployed Marines, on the other hand, is an open population, in that the individual subjects are periodically arriving and leaving in large groups. The individuals change, but the basic demographics of the population do not change appreciably over time. A survey done at another point in time may be expected to yield different results. However, other studies, such as the DOD worldwide survey (Bray et al., 1995), consistently show that the Marines as a group have the highest alcohol consumption within the military. The population of Marines deployed on Okinawa is composed of four different battalions totaling approximately 3,600 personnel at any one time. There is no reason to believe that the alcohol consumption patterns reflected in this survey population would be appreciably different from similar populations surveyed at other times.

CHAPTER IV

RESULTS

Introduction

Data describing the survey population is presented first, including a depiction of data comparing the three battalions. Analysis of the three outcome variables follows, each considered separately. The same tables are presented for each outcome variable, including a table showing how each outcome variable relates to the alcohol consumption categories.

The survey item inquiring whether the respondent's spouse is currently living with the serviceman had a Pearson correlation coefficient of .860 with marital status stratified into three categories (married, single or never married, other). Because most studies in the literature use marital status variables, that item was chosen for inclusion in the analysis.

The two survey items "family history of alcohol dependence" and "family history of alcohol abuse" (collapsed into two categories of agree vs. disagree) had a Pearson correlation coefficient of 0.812. Of the two, the alcohol abuse variable was selected for the analysis because it was felt that respondents would have a better judgment of abuse rather than dependence, which is a more clinical term.

Since the responses for these two items were very similar, either item could have been used.

The two survey items “family history of drug dependence” and “family history of drug abuse” (collapsed into two categories of agree vs. disagree) had a Pearson correlation coefficient of 0.932. For the same reason noted above, family history of drug abuse was selected for inclusion in the analysis. Interestingly, the Pearson correlation between family history of alcohol abuse and family history of drug abuse is only 0.261.

All items regarding drug use other than alcohol were excluded because these items were answered the same by over 90% of the respondents (Table 2). “Days deployed at sea during the previous 30 days” was not used because only 3.5% reported having been deployed any time in the previous 30 days.

Descriptive Data

Sample Characteristics

A total of 201 U.S. Marines completed a survey. All of the respondents were male and mostly represented single, high school educated, Caucasian infantry Marines in the lower enlisted paygrades. Respondents were drawn from three different battalions: one battalion was stationed at Camp Hansen and the other two were stationed at Camp Schwab.

Available general demographic variables do not indicate significant differences between abstainers and users (see Table 3). There was no significant

Table 2

Other Drug Use in the Past 12 Months

	Percent answering "never used"
Marijuana or hashish	93.4
PCP	100.0
LSD, other hallucinogens	98.5
Cocaine	97.5
Amphetamines, stimulants	98.0
Tranquilizers, depressants	99.0
Barbiturates, sedatives	99.5
Heroin, opiates	99.5
Analgesics, narcotics	98.5
Inhalants	99.5
"Designer" drugs	97.4
Anabolic steroids	97.4

Table 3

Sample Characteristics

	Total sample (<u>n</u> = 201)	Abstainers (<u>n</u> = 29)	Nonabstainers (<u>n</u> = 171)	Significance
Age, years				.665 ^a
Mean (SD)	21.5 (2.5)	21.3 (2.7)	21.6 (2.5)	
Minimum-maximum	17-30	18-30	17-30	
Length on active duty (years)	2.34	2.21	2.36	.641 ^a
Mean (SD)	(1.57)	(1.16)		
	<u>n</u>	<u>n</u> (%)	<u>n</u> (%)	
Gender				NA*
Male	201	29 (100)	171 (100)	
Female	0	0	0	
Battalion				.883 ^c
A	71	10 (14.1)	61 (85.9)	
B	54	7 (13.0)	47 (87.0)	
C	75	12 (16.0)	63 (84.0)	
Education				.062 ^c
High school grad, GED, ABE	149	26 (17.4)	123 (82.6)	
More than high school	47	3 (6.4)	44 (93.6)	
Paygrade				.388 ^b
E 1-3	157	21 (13.4)	136 (86.6)	
E 4-6	43	8 (18.6)	35 (81.4)	
Race				.318 ^b
White	137	17 (12.4)	120 (87.6)	
Hispanic	30	7 (23.3)	23 (76.7)	
Other (Black, Am. Indian, Oriental)	28	4 (14.3)	24 (85.7)	
Marital status				.856 ^c
Married	41	5 (12.2)	36 (87.8)	
Separated/divorced, widowed	11	2 (18.2)	9 (81.8)	
Single	148	22 (14.9)	126 (85.1)	

(table continues)

Table 3 (continued)

	Total sample (<u>n</u> = 201)	Abstainers (<u>n</u> = 29)	Nonabstainers (<u>n</u> = 171)	Significance
Military job type				.567 ^c
Infantry	166	23 (13.9)	143 (86.1)	
Other	34	6 (17.6)	28 (82.4)	
Months in Okinawa				.494 ^c
1-3				
4-8	121	19 (15.6)	102 (84.4)	
	74	9 (12.2)	65 (87.8)	
Age of first use	165	154 (3.7)	161 (2.5)	.471 ^a
Family history of alcohol abuse				.514 ^c
Yes	79	9 (11.4)	70 (88.6)	
No	102	15 (14.7)	87 (85.3)	
Family history of drug abuse				.297 ^c
Yes	37	7 (18.9)	30 (81.1)	
No	146	18 (12.3)	128 (87.7)	

NA = Not applicable. Sum of percentages may not equal 100% due to rounding. Some variables have fewer total cases due to missing data.

^aIndependent samples t-test

^bSpearman rank correlation

^cPearson chi-square

difference in the abstention rate between battalions (14.1%, 13%, and 16% for Battalions A, B, and C, respectively, $p=.883$), or by race, job type, or marital status. There was a trend for those having experience in education beyond high school to more likely be drinkers, although the difference does not reach statistical significance.

Total Alcohol Consumption

Table 4 and Figure 3 show the total alcohol consumption among this sample of drinking Marines. The distribution is skewed to the left, deceptively suggesting that most of these Marines' consumption is low. One must pay close attention to the abscissa, recognizing the high volume of alcohol reflected in these numbers. While several heavy drinkers account for a large amount of the alcohol consumed, analysis of the reported pattern of drinking nonetheless indicates that heavy alcohol use is highly prevalent in this population. Among drinkers, 15 (8.8%) reported light or infrequent use, 12 (7.0%) reported moderate use, 32 (18.7) reported moderately heavy use, and 112 (65.5%) reported a heavy alcohol use pattern (see Table 1 for pattern definitions).

Tables 5 and 6 show differences of alcohol consumption within demographic variable categories. For the total sample of drinkers, mean alcohol consumption was 148 drinks (standard deviation of 177). Mean alcohol consumption did not show significant variation with respect to these demographic variables, except for age of first use and length on active duty. The data indicate

Table 4

Drinks Consumed Over the Prior 30 Days, by Consumption Pattern

	n (% of total)	Category mean (range)
Abstainers	29 (14.5)	0
Light	15 (7.5)	4.0 (1-9)
Moderate	12 (6.0)	14.6 (6-32)
Moderate/heavy	32 (16.0)	36.0 (12-160)
Heavy	112 (56.0)	213.0 (24-975)

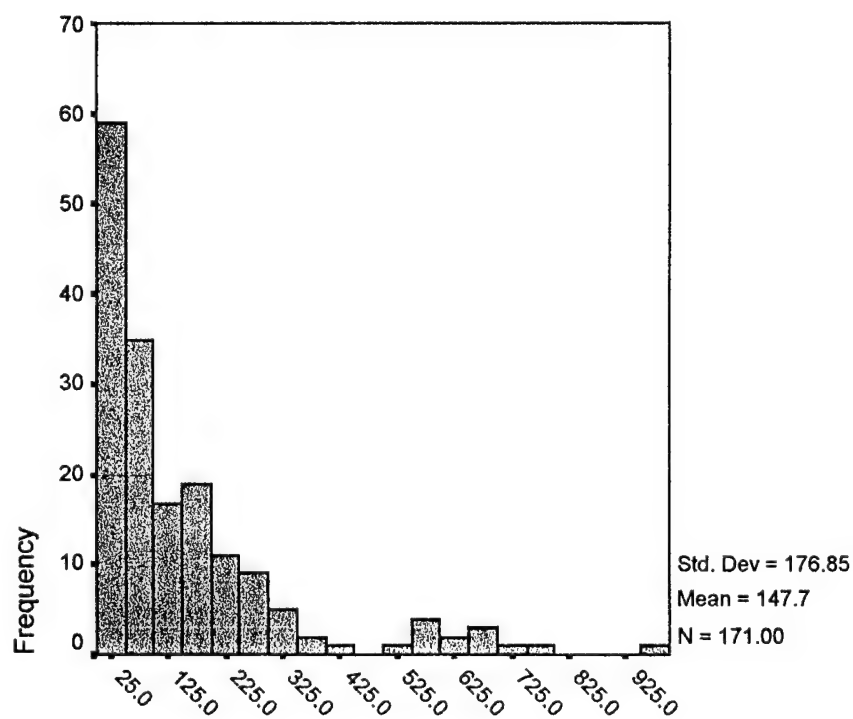


Figure 3. Alcohol consumption among drinkers, measured in total drinks over the previous 30 days.

Table 5

Comparison of Mean Alcohol Consumption (Log Transformation) Within Selected Demographics,
Abstainers Excluded

	n	Mean alcohol consumption, log of drinks over the past 30 days (SD)	Within-group significance ^a
Entire sample	171	4.22 (1.47)	NA*
Battalion			.256
A	61	4.45 (1.52)	
B	47	4.19 (1.47)	
C	63	4.01 (1.43)	
Education			.908 ^b
High school grad, GED/ABE	123	4.23 (1.5)	
More than high school	44	4.26 (1.3)	
Paygrade			.143
E 1-3	136	4.30 (1.46)	
E 4-6	35	3.89 (1.52)	
Race			.753
White	120	4.18 (1.38)	
Hispanic	23	4.41 (1.49)	
Other	24	4.32 (1.90)	
Marital status			.606
Married	35	4.00 (1.70)	
Separated/divorced/widowed	9	4.27 (1.48)	
Single	123	4.27 (1.41)	
Military job type			.818 ^b
Infantry	143	4.23 (1.40)	
Other	28	4.15 (1.82)	
Months on Okinawa			.706
1-3	102	4.19 (1.47)	
4-8	65	4.27 (1.50)	
Weeks on leave during past 30 days			.730
0	131	4.20 (1.46)	
1-2	14	4.39 (1.38)	
3-4	21	4.34 (1.66)	

(table continues)

Table 5 (continued)

	<u>n</u>	Mean alcohol consumption, log of drinks over the past 30 days (<u>SD</u>)	Within-group significance ^a
Family history of alcohol abuse			.940
Yes	70	4.24 (1.43)	
No	87	4.22 (1.43)	
Family history of drug abuse			.783
Yes		4.29 (1.43)	
No	30	4.20 (1.54)	
	128		

^aindependent samples *t*-test for dichotomous variables, ANOVA for variables with three values.

^bunequal variance

NA = Not applicable

Table 6

Univariate Linear Regression Analysis for Continuous Variables and Log of Total Consumption

	<u>B</u>	<u>SE</u>	<u>t</u>	Significance
Age, years (increasing)	-.081	.045	-1.80	.074
Age of first use, years (increasing)	-.207	.042	-4.97	<.001*
Length on active duty, years (increasing)	-.166	.070	-2.39	.018*

*Significant at alpha = .05.

an inverse relationship between alcohol consumption and both the year of first use and years on active duty.

Battalion Variables

Battalion assignment was significantly associated with all three outcome variables in the univariate analyses, and remained in the multivariate model for "dependence symptoms" and "serious consequences." Compared to members of the other two battalions, a Marine representing Battalion C is significantly older, has more active duty time, and is generally higher in rank (Table 7). There is a trend for Battalion C members to consume less alcohol and to report being married. Marines in Battalion B have spent significantly more time on Okinawa and are more likely to report dependence symptoms and serious consequences.

Table 7

Influence of Battalion Assignment on Selected Variables

	Battalion A	Battalion B	Battalion C	Significance
Sample size	61	47	63	
Mean age (years) ^a	20.9	21.5	22.2	.009*
Age of first use of alcohol ^a	15.7	16.4	16.2	.451
Total alcohol consumption (drinks) ^a	184.4	143.0	115.8	.094
Years on active duty ^a	2.04	2.07	2.83	.004*
% in grades E1-3 ^b	86.9	93.6	61.9	<.001*
% reporting FH alcohol abuse ^b	35.7	55.8	44.8	.137
% reporting FH drug abuse ^b	14.9	26.0	20.6	.303
% on Okinawa for 1-3 months ^b	74.6	4.3	97.8	<.001*
% married ^b	13.1	21.3	28.6	.108
% White/Hispanic/other ^b	71.7/15/13.3	71.1/13.3/15.6	72.6/12.9/14.5	.204
% drinkers reporting productivity loss ^b	24.6	24.4	11.1	.107
% drinkers reporting serious consequences ^b	3.8	30.2	8.3	<.001*
% drinkers reporting dependence symptoms ^b	25.0	58.7	39.7	.003*

*one-way ANOVA;

^bchi-square test;

*comparison between groups has a significance level <.05

Outcome Variable Analysis

Serious Consequences

“Serious consequences” attributed to alcohol use were determined by analysis of the questionnaire items noted in the Appendix B. Among drinkers with complete data, 20 of 155 (12.9%) reported serious consequences on Okinawa.

Table 8 summarizes the univariate analysis for serious consequences on Okinawa with demographic and alcohol consumption variables. A report of serious consequences was significantly associated with total alcohol consumption ($p = 0.0056$), self-reported family history of alcohol abuse ($p = 0.0199$), Battalion A compared to B ($p = 0.0027$), and duration of current stay on Okinawa ($p = 0.0164$).

The following variables were entered in a logistic regression model and subjected to a backward stepwise elimination procedure: log of total consumption, battalion, family history of alcohol abuse, and months on Okinawa. “Months on Okinawa” was eliminated, leaving the three variables shown in Table 9. The results of the analysis show that both total consumption and battalion membership (in particular Battalion A vs. B) significantly predict serious consequences when controlled for the other variables. The following interaction terms were tested and found not to add significantly to the model: log of total consumption by battalion ($p = 0.832$) and log of total consumption by family history of alcohol abuse

Table 8

Univariate Analysis for "Serious Consequences on Okinawa" (Alcohol Abstainers Excluded)

	<u>n</u>	Odds ratio	95 % CI	<u>p</u>
Age in years (increasing)	155	1.024	.855-1.23	.795
Log total consumption (increasing)	155	1.88	1.20-2.94	.0056*
Age of first use of alcohol in years (increasing)	146	.882	.716-1.09	.234
Family history of alcohol abuse	145			
Disagree or strongly disagree	83	1.0 ^a		
Agree or strongly agree	62	3.40	1.21-9.55	.0199*
Family history of drug abuse	144			
Disagree or strongly disagree		1.0 ^a		
Agree or strongly agree		1.84	.559-5.67	.2867
Battalion	155			
A	52	1.0 ^a		
B	43	10.8	2.29-51.3	.0027*
C	60	2.27	4.22-12.2	.339
Education	152			
High school or GED	111	1.0 ^a		
More than high school	41	1.19	.423-3.33	.744
Race	151			
Hispanic	21	1.0 ^a		
White	112	.558	.163-1.92	.354
Other	18	.850	.163-4.43	.847
Marital Status	155			
Married	35	1.0 ^a		
Separated/divorced/widowed	7	NC		
Single, never married	113	1.29	.398-4.11	.680
Paygrade	155			
E-1 to E-3	122	1.0 ^a		
E-4 to E-6	33	.618	.170-2.25	.465
Months in Okinawa	151			
1-3	92	1.0 ^a		
4-8	59	4.05	1.44-11.36	.0079**
Years on active duty	149	.858	.584-1.26	.435

(table continues)

Table 8 (continued)

	<u>n</u>	Odds ratio	95 % CI	<u>p</u>
Weeks on leave in past 30 days	150			
0	118	1.0*		
1-2	13	1.25	.252-6.19	.786
3-4	19	.808	.169-3.85	.789

*reference category

NC = not calculable because of empty cells

*significant at alpha = .05

Table 9

Multivariate Logistic Regression Analysis for "Serious Consequences"

	<u>B</u>	<u>SE</u>	Wald	OR (95% C.I.)	Significance
Log of total alcohol consumption	.874	.321	7.39	2.40 (1.28-4.50)	.0065*
Battalion					
A				1.0	
B	3.38	1.12	9.19	29.50 (3.31-262.7)	.0024*
C	1.79	1.15	2.43	6.01 (.631-57.2)	.119
Family history of alcohol abuse	1.19	.615	3.72	3.27 (.981-10.9)	.0538
Constant	-7.11	1.82	15.20		.0001

OR = odds ratio

CI = confidence interval

*significant at alpha = .05

($p = 0.498$). There is a trend for those reporting a family history of alcohol abuse to be more likely to report serious consequences.

The odds ratios indicate that for every log increase in alcohol consumption, the likelihood of reporting serious consequences increases by a factor of 2.40. In other words, compared to someone with a consumption of 7.3 drinks (e^2), a person consuming 20.1 drinks (e^3) is 2.4 times as likely to report serious consequences. Compared to a person reporting 148 drinks (e^5), a person consuming 403 drinks (e^6) also is 2.4 times as likely to report serious consequences. The incremental increase in likelihood of reporting serious consequences tapers off when increasing alcohol consumption is considered linearly.

The dose response relationship between serious consequences and alcohol consumption category adjusted for battalion and family history of alcohol abuse is shown in Table 10. Unfortunately, a serious limitation exists because of data inadequacy: there were no reports of serious consequences among the two lowest consumption categories, making calculation of odds ratios for these two categories impossible. The dose-response relationship cannot be commented on with confidence because of the lack of data.

Productivity Loss

Table 11 shows the univariate analysis of productivity loss while serving

Table 10

Relationship Between Alcohol Consumption Category and "Serious Consequences on Okinawa" (Excluding Abstainers). Controlling for Battalion and Family History of Alcohol Abuse

Consumption category (<u>n</u>)	Serious consequence reported		Odds ratio	95 % C.I.	Significance
	No	Yes			
Heavy (93)	77	16	1.26	.345-4.64	.724
Moderate/heavy (35)	31	4	.1.0*		
Moderate (10)	10	0	NC		
Light/infrequent (17)	17	0	NC		

NC = not calculated

*reference category

Table 11

Univariate Analysis for Productivity Loss on Okinawa Abuse (Alcohol Abstainers Excluded)

	<u>n</u>	Odds ratio	95 % CI	Significance
Family history of alcohol abuse	152			
Disagree or strongly disagree	87	1.0 ^a		
Agree or strongly agree	65	2.02	.898-4.52	.0893
Family history of drug abuse	152			
Disagree or strongly disagree	126	1.0 ^a		
Agree or strongly agree	26	1.49	.564-3.93	.422
Battalion	165			
A	57	1.0 ^a		
B	45	.994	.401-2.47	.989
C	63	.384	.143-1.03	.0582
Education	161			
High school or GED	118	1.0 ^a		
More than high school	43	1.32	.568-3.08	.517
Race	161			
White	117	1.0 ^a		
Hispanic	23	3.53	.133-9.38	.0113*
Other	21	1.72	.559-5.28	.345
Marital Status	165			
Single, never married	121	1.0 ^a		
Married	36	1.03	.401-2.64	.953
Separated/divorced/widowed	8	1.42	.269-7.50	.679
Paygrade	165			
E-1 to E-3	130	1.0 ^a		
E-4 to E-6	35	.470	.153-1.44	.187
Months in Okinawa				
1-3	100	1.0 ^a		
4-8	61	2.01	.913-4.45	.0830
Years on active duty (increasing)	158	.885	.659-1.19	.418
Weeks on leave in past 30 days	160			
0	127	1.0 ^a		
1-2	13	2.12	.600-7.51	.244
3-4	20	1.19	.364-3.91	.771

CI = confidence interval ^areference category *significant at the alpha = .05 level

on Okinawa with alcohol use and demographic variables. Among drinkers with complete data, 32 of 165 (19.4%) reported productivity loss.

Productivity loss was significantly associated with total alcohol consumption ($p = .0027$) and white race versus Hispanic ($p = .0113$). Interestingly, as opposed to the "serious consequences" variable noted above, the relationship between productivity loss and both length of stay on Okinawa (.0983) and family history of alcohol abuse (.0893) did not reach statistical significance, although the data do indicate a trend. Also, in the case of productivity loss, there were no significant differences by home base, though home base comes close to the defined significance level of .05.

The following variables were entered into a logistic regression model: log of total consumption, family history of alcohol abuse, battalion, race, and months on Okinawa. After subjecting the model to a backward stepwise elimination procedure, a final model containing three variables remained. Race, family history of alcohol abuse, and the measure of alcohol consumption were each significantly associated with the report of productivity loss, adjusted for the other variables. The following interaction terms were tested and found not to add significantly to the model: log of total consumption by family history of alcohol abuse ($p = .764$) and log of total consumption by race ($p = .117$) (Table 12).

The relationship between alcohol consumption category and productivity loss on Okinawa is shown in Table 13. No clear trend for a dose-response is indicated.

Table 12

Multivariate Logistic Analysis for Productivity Loss

	<u>B</u>	<u>SE</u>	Wald	OR (95% C.I.)	Significance
Log of total alcohol consumption (increasing)	.460	.184	6.27	1.58 (1.11-2.27)	.0123*
Race			4.05		.1322
White				1.0*	
Hispanic	1.10	.546	4.02	2.99 (1.03-8.72)	.0449*
Other	.373	.663	.316	1.45 (.396-5.32)	.574
Family history of alcohol abuse	.771	.444	3.02	2.16 (.906-5.16)	.0823
Constant	-3.59	.963	13.9		.0002

*reference

*significant at alpha = .05

Table 13
 Relationship Between Consumption Category and "Productivity Loss on Okinawa," Controlling for Race and Family History of Alcohol Abuse

Consumption category (n)	Reported Productivity Loss No	Yes	Odds ratio	95% C.I.	Significance
Heavy (99)	75	24	4.99	.600-1.6	.137
Moderate/heavy (38)	32	6	3.10	0.326-29.4	.325
Moderate (11)	10	1	2.67	0.137-52.0	.516
Light/infrequent (17)	16	1	1.00*		

*reference category

Symptoms of Dependence

Table 14 shows the univariate analyses for dependence symptoms while on Okinawa with alcohol consumption and demographic variables. Among drinkers with complete data, 66 of 165 (40%) reported symptoms of dependence.

As in the case of the other two outcome variables, dependence symptoms are strongly associated with total alcohol consumption ($p < .001$). In addition, age of first use ($p = .0249$), self-reported family history of alcohol abuse ($p = .0042$), battalion ($p < .001$), length of stay on Okinawa ($p = .0184$), and length of active duty service ($p = .0397$) were all individually significantly associated with dependence symptoms. Symptoms of dependence were the only adverse outcomes significantly associated with age of first use of alcohol.

These data indicate that respondents reporting symptoms of dependence are heavier consumers of alcohol, have been on Okinawa longer, have less active duty time, are more likely to report a family history of alcohol abuse, began drinking alcohol at younger ages, and are more likely to belong to Battalion B.

The following variables were entered into a logistic regression model: log of total consumption, age of first use of alcohol, family history of alcohol abuse, battalion, months on Okinawa, weeks on leave in the past 30 days, and years of active duty service. After a backward stepwise elimination procedure, a final model containing only five variables remained. Battalion, family history of alcohol abuse, years on active duty, and a measure of alcohol consumption were each

Table 14

Univariate Analysis for Dependence Symptoms on Okinawa (Alcohol Abstainers Excluded)

	<u>n</u>	Odds ratio	95 % CI*	Significance
Age in years (increasing)	165	.966	.851-1.10	.594
Log total consumption (increasing)	165	2.21	1.61-3.03	<.001**
Age of first use of alcohol in years (increasing)	153	.856	.747-9.81	.0249**
Family history of alcohol abuse	153			
Disagree or strongly disagree	87	1.0 ^a		
Agree or strongly agree	66	2.65	1.36-5.16	.0042**
Family history of drug abuse	153			
Disagree or strongly disagree	127	1.0 ^a		
Agree or strongly agree	26	1.92	.820-4.49	.1327
Battalion	165			
A	56	1.0 ^a		
B	46	4.26	1.84-9.90	<.001**
C	63	1.97	.898-4.34	.0907
Education	161			
High school or GED	119	1.0 ^a		
More than high school	42	1.19	.583-2.43	.633
Race	161			
Hispanic	116	1.0 ^a		
White	23	1.50	.610-3.69	.377
Other	22	1.36	.544-3.42	.508
Marital Status	165			
Married	36	1.0 ^a		
Separated/divorced/widowed	8	.670	.139-3.24	.619
Single, never married	121	.686	.324-1.45	.324
Paygrade	165			
E-1 to E-3	130	1.0 ^a		
E-4 to E-6	35	1.60	.723-3.54	.246
Months on Okinawa	161			
1-3	99	1.0 ^a		
4-8	62	4.05	1.16-4.29	.0397**

(table continues)

Table 14 (continued)

	<u>n</u>	Odds ratio	95% CI*	Significance
Weeks on leave in past 30 days	127	1.0 ^a		
0	13	1.16	.369-3.64	.801
1-2	20	.338	.107-1.07	.0647
3-4				
Years on active duty (increasing)	157	.748	.567-.987	.0397**

^areference category

*CI = confidence interval

**significance at alpha = .05

significantly associated with the report of dependence symptoms, adjusted for the other variables. For those having been on vacation for 1-2 weeks in the past 30 days, there was a trend toward an association with fewer reports of dependence symptoms. The following interaction terms were tested and found to not add significantly to the model: log of total consumption by age ($p=.3049$), log of total consumption by battalion ($p = .2129$), log of total consumption by family history of alcohol abuse ($p = .0717$) (Table 15).

The relationship between alcohol consumption category and dependence symptoms on Okinawa is displayed in Table 16. Again, no clear and convincing dose-response relationship is evident.

Table 15

Multivariate Analysis for "Dependence Symptoms"

	B	SE	Wald	Adjusted OR (95% C.I.)	Significance
Log of total consumption (increasing)	1.010	.230	19.21	2.75 (1.75-4.31)	<.0001*
Family history of alcohol abuse	1.237	.456	7.357	3.44 (1.41-8.42)	.0067*
Years on active duty (increasing)	-.498	.248	4.033	.608 (.374-988)	.0446*
Battalion					
A				1.0	
B	2.029	.638	10.13	7.61 (2.18-26.55)	.0015*
C	2.067	.661	9.79	7.90 (2.17-28.9)	.0018*
Weeks on leave in the past 30 days					
0				1.0	
1-2	1.385	.848	2.67	4.00 (.758-21.1)	.103
3-4	-.824	.877	.883	4.39 (.0787-2.45)	.348
Constant	-4.31	1.23	12.16		.0005

*significant at alpha = .05

Table 16

Relationship Between Consumption Category and "Dependence Symptoms on Okinawa," Controlling for Battalion, Years of Active Duty, and Family History of Alcohol Abuse

Consumption category (n)	Dependence Symptoms Reported		Odds ratio	95 % C.I.	Significance
	No	Yes			
Heavy (99)	56	43	5.71	1.06-30.9	.043
Moderate/heavy (37)	8	29	1.18	0.189-7.36	.860
Moderate (11)	2	9	1.0*		
Light/infrequent (15)	0	18			

*reference category

CHAPTER V

DISCUSSION

Review of Current Findings

The findings of this study reinforce anecdotal observations that many Marines deployed to Okinawa are heavy drinkers. The definition of "heavy" drinker used here corresponds to the definition of "binge" drinking used in most studies reported in the literature, although some use a 2-week time period rather than the 30-day time period used for the survey reported here. Of the entire sample of Marines, 85.5% reported some amount of alcohol use, and 50% of the sample (58% of drinkers) reported alcohol consumption in the "heavy" category, meaning that they drank at least 5 drinks in one sitting at least 4 times in the previous 30 days. Mean consumption for drinkers was 148 drinks over a 30-day period, an average of close to 5 drinks each day. Total alcohol consumption was the only variable significantly related to all three adverse outcomes, after controlling for other variables. This information supports the hypothesis that higher alcohol consumption is associated with increasing risk of adverse outcomes.

Self-reported serious consequences occurred in 12.9% of drinkers and were positively associated with increasing alcohol consumption, a family history of alcohol abuse, and battalion membership. "Serious consequences" includes

disciplinary actions that are likely to be dependent on the attitudes and practices of the battalion command structure and not individual subject variables (i.e., the same activity may result in disciplinary action in one battalion but not a different battalion). The battalions' composition differed in important ways, but it is not possible to tease out this effect from the data obtained in this survey, with only three battalions represented. However, the fact remains that the amount of total alcohol consumption constitutes a significant predictor of self-reported serious consequences, even after controlling for battalion membership.

Loss of productivity occurred in 19.4% of drinkers and was associated with total alcohol consumption, race, and family history of alcohol abuse. The association with race was unexplainable: Hispanics were 3 times as likely to report loss of productivity than Caucasians, even though their total alcohol consumption, battalion membership, and family history of alcohol abuse were not significantly different. There are no data from other studies of military populations available in the published literature that can help corroborate or explain this finding. Again, even controlling for race and family history of alcohol abuse, both of which cannot be changed by an individual, the total consumption variable remains a significant predictor of productivity loss.

The most prevalent adverse outcome category was "symptoms of dependence" which were reported by 38% of drinkers. This figure is striking particularly when compared to data from the DOD (Bray et al., 1995) survey showing a prevalence of 16.3% among E1-E3 Marines. Dependence symptoms

were significantly associated with total alcohol consumption in the prior 30 days, a family history of alcohol abuse, years on active duty, and battalion membership. Those with more years on active duty are significantly less likely to report dependence symptoms. Particularly surprising is the strength of the battalion variation. Compared to Battalion A, members of Battalions B and C were nearly eight times as likely to report dependence symptoms, even after controlling for total alcohol consumption, family history of alcohol abuse, years on active duty, and recent leave (vacation). One would not expect battalion command characteristics to have a strong impact on symptom reporting. More data from additional battalions would be necessary to investigate this finding further.

There was no evidence for a dose response relationship between any of the outcome variables and alcohol use by pattern of drinking. However, because of both the width of the confidence intervals and the difficulty of assuring accurate category assignment as noted in the definitions section, this information may not be reliable and should be interpreted with caution.

It is interesting to note the influence of family history of alcohol abuse on adverse outcomes. While the specific definition for this term was left to the individual respondents, at least the individual's perception of having witnessed or experienced substance abuse in his family has some relationship to his current alcohol experiences, even after controlling for the total alcohol consumption. Factors of the family of origin can have strong influences on the alcohol use practices of young adults, as studied among college students. These influences

include a positive relationship of reported frequency of heavy drinking and intoxication between parents and students (McCrary, 1994). Persons with a family history of alcohol abuse are at higher risk of experiencing adverse consequences of alcohol use themselves.

Age of first regular use of alcohol is another indicator of the potential influence from the family of origin. This variable achieved significance in only the univariate analysis with dependence symptoms and dropped out after adjustment for other factors. It is interesting to speculate that there might be some biologic mechanism favoring a susceptibility to alcohol dependence with younger regular use, but the data here are insufficient to make that connection. Labouvie, Bates, and Pandina (1997) reported a longitudinal study wherein 839 people were followed prospectively. Age of first use of alcohol was correlated (coefficient of $-.39$ for males) with level of alcohol use at age 20 but less correlated with alcohol use at age 30 (coefficient of $-.19$), indicating that factors influenced by age of first use lose their impact later in life.

Battalion membership remained a significant variable in two of the three outcomes: serious consequences and dependence symptoms. Battalions themselves may have unique characteristics, or there may have been an unknown underlying subject selection factor that determined which battalion members took the survey. For example, perhaps some of the younger members of Battalion C were at some other training when the survey was administered, resulting in a sample group that was skewed toward the slightly older battalion members who drink generally less

alcohol, are more likely to be married, and have attained higher paygrades.

Nonrandom selection could explain some of the battalion variation and represents one of the limitations of this study as discussed below.

In all three final models, age, marital status, and educational status were not significant contributors; race remained in only one model. Studies reported in the literature commonly adjust their findings by age, race, educational level, and marital status. That these variables were not more significant predictors of adverse outcomes could be a result of relatively restricted demographic characteristics of the sample, which consisted mostly of young, Caucasian, single men with a high school education. Or it could reflect the possibility that these demographic factors are of little importance in this particular population; heavy drinking and associated adverse outcomes are prevalent regardless of one's age, race, educational attainment, or marital status. Running the same final models for each of the outcome variables but including age did not change the significance of any of the existing variables appreciably (analyses not shown). Perhaps if you are deployed to Okinawa, you are likely to drink heavily no matter who you are. Discrimination between these two possible explanations is not possible with the available data.

Comparison of Prevalence With Other Studies Reported in the Literature

Studies of the prevalence of heavy or binge drinking in young adults were described above. In the College Alcohol Study, 50% of the males reported binge

drinking, close to the prevalence in this group of Marines. The Monitoring the Future Study indicated a prevalence of 47% in male college students, and the Core Institute (1997) compilation indicated a 48.4% prevalence of binge drinking in college age males during 1992-94. These studies show a remarkable similarity in prevalence of binge drinking in the populations studied which, in turn, is similar to the prevalence in the sample of Marines reported here.

The 50% prevalence of heavy drinking in this study population exceeds that of the Marine Corps in general as reported from the 1995 worldwide survey (38.2% among 18-25 year old males), and exceeds that of 18-25 year old male civilians (18.6%, standardized to DOD demographics). The DOD worldwide survey (Bray et al., 1995) has shown an unadjusted prevalence of heavy use of alcohol between 23.9 and 30.6% in the USMC for the years 1980 through 1995. Although the prevalence fluctuates, the rate of heavy drinking increased each of the last three survey years, portending an increase over time. The survey reported here was conducted in 1997, but at no time since 1980 has the overall prevalence of heavy drinking in the USMC exceeded 33%. One would not expect the overall USMC prevalence to have increased to 50% in the two years since the last worldwide survey.

Recommendations

When attempting to reduce health-adverse behaviors, a prudent first step is to uncover segments of the target population that contribute more heavily to the

risk. Among the military services, Marines have the highest alcohol use, and among the Marines, this survey has shown that a high-prevalence population exists among those deployed to Okinawa. Armed with these data, researchers or interventionists can apply programs designed to reduce alcohol consumption in this group. In terms of decreasing overall alcohol consumption in the DOD, these deployed Marines represent "low-lying fruit."

Limitations of the Current Study

These findings should be interpreted with caution due to the small sample size and nonrandom selection methods. The data could be improved with more subjects representing more battalions. More subjects would strengthen the ability to determine whether trends represent true or random findings. For example, while the data presented here indicate a clear dose-response relationship between alcohol consumption pattern and productivity loss, the relationship does not meet generally accepted definitions of statistical significance. Including more subjects would serve to tighten the confidence in the data. Including subjects from other battalions could help determine the contribution of battalion membership itself in the reporting of adverse outcomes.

Generalization of the findings could also be more strongly defended had surveys been done among groups in Okinawa at different times of the year. It is possible, with this constantly changing population, that the surveyed groups represent alcohol consumption patterns uncharacteristic of the whole population

for some unknown reason. Fortunately, however, the alcohol consumption data presented here corresponds to anecdotal and informal observational information.

The survey instrument includes the phrase "related to alcohol" within the adverse consequence questions. It is therefore problematic to compare drinkers with nondrinkers in the rates of reported adverse consequences for those items. More than half of the abstainers did not answer the questions about adverse outcomes, and one respondent reported dependence symptoms despite reporting no alcohol consumption (data not shown). One would expect that including abstainers would strengthen the statistical association of alcohol consumption with the adverse consequences.

Self-reported data is subject to recall and response biases. These subjects are members of a disciplinarian society. One might expect that respondents may underreport their alcohol use since people generally do, for fear of individual or institutional retaliation for heavy use. On the other hand, one might expect Marines of this age group to embellish their alcohol use (anecdotal observations of the author). Corroborating external data on alcohol consumption would serve to strengthen the confidence in the alcohol consumption variables. Corroboration of the adverse consequences through review of police logs, medical records, and work records would strengthen confidence in the adverse consequence variables, but would be impossible to accomplish on an individual basis using anonymous survey methods.

Subject selection methods were determined for practical reasons. Surveying a large group is easy with the permission of the unit commander. This unit-based, group selection process was chosen to expedite the survey process. A more representative sample could be obtained using random selection techniques, although this method would have added to the expense and duration of this preliminary study.

The intent of this survey was to establish a preliminary estimate of the extent of alcohol consumption in this population of U.S. Marines and the ability of alcohol consumption levels to predict adverse consequences, anticipating that more extensive data collection would be included as part of an intervention. Despite the limitations noted here, the survey met this goal.

Recommendations for Future Research

Further research should be directed at discovering specific factors associated with level of alcohol consumption in this unique population. None of the demographic variables tested in these data are significantly associated with alcohol consumption, in contrast to other studies reported in the literature. This population may represent a uniquely homogeneous group in terms of alcohol consumption, and other factors such as attitudes, alcohol availability, or battalion-specific factors may play a more important role than demographics.

Why are Hispanics three times more likely to report productivity loss than Caucasians? Is this a cultural reporting difference or are these Hispanic Marines

more susceptible to work-related effects? These questions cannot be answered with the available data but warrant further research for corroboration or explanation.

No studies could be found indicating the extent to which in-garrison alcohol consumption decreases actual combat effectiveness. One study using self-administered surveys studied correlates of physical fitness among 1,314 U.S. Army personnel (Zadoo, Fengler, & Catterson, 1993). The data indicated that there was no significant difference between alcohol users and nonusers at the highest of five fitness levels; nondrinkers were marginally better in two other fitness levels and worse in one. This was not an operational environment, although one might infer that physical fitness reflects some partial measure of combat effectiveness. Certainly Marines are more than just war machines, but combat operations are their purpose for employment. Evidence is needed regarding the impact of excessive alcohol consumption on actual operational success, particularly alcohol consumption that occurs during times of no direct combat.

Additional research could be directed at determining the role of those factors that are not controllable by the USMC might play in alcohol consumption. For example, age at first use of alcohol and family history of alcoholism are two factors the USMC has no control over and has no way of altering. If recruits' alcohol consumption patterns are significantly predictable by factors such as these, then the task of reducing consumption will be quite a bit harder. On the other hand, modifiable factors such as alcohol consumption or battalion command characteristics are factors the USMC has more direct control over.

Conclusion

U.S. Marines deployed to Okinawa drink a lot of alcohol. Self-reported serious adverse consequences are positively associated with reported alcohol consumption. The more one drinks, the more one is likely to experience adverse consequences that have negative impacts on the health and work capacity of these Marines. The accumulated effects of these self-reported adverse consequences jeopardize the point of the American combat spear.

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APPENDIX A

**1997 SURVEY OF HEALTH-RELATED BEHAVIORS
AMONG U.S. MARINE CORPS PERSONNEL**



**1997 SURVEY OF HEALTH-RELATED BEHAVIORS
AMONG U.S. MARINE CORPS PERSONNEL**

Is this survey anonymous? Yes. DO NOT WRITE YOUR NAME OR SOCIAL SECURITY NUMBER ANYWHERE ON THIS BOOKLET.

INTRODUCTION

Who are we? We are from the Naval Health Research Center in San Diego, California.

How were you selected? You were randomly selected to participate in this important survey.

Must you participate? Your participation in this survey is voluntary. We encourage you to answer all of the questions honestly, but you are not required to answer any question to which you object.

What are the questions about? Mainly about alcohol and drug use. Additional questions ask about health attitudes and behavior, such as exercise.

INSTRUCTIONS FOR COMPLETING THE QUESTIONNAIRE

- Most questions provide a set of answers. Read carefully all the printed answers before marking your choice. If none of the printed answers exactly applies to you, mark the circle for the one answer that best fits your situation. It is very important that you answer all questions honestly and completely. We appreciate your time and care in completing this survey.

- Use only the pencil you were given.
- Make heavy black marks that fill the circle for your answer.

CORRECT MARK

○ ○ ● ○

INCORRECT MARKS

✓ ✗ ⊙ ⊖

- Erase cleanly any answer you wish to change.
- Do not make stray marks of any kind anywhere in this booklet.
- For many questions, you should mark only one circle for your answer in the column below the question as shown here:

EXAMPLE: How would you describe your health?

- Excellent
- Good
- Fair
- Poor

PRIVACY ACT STATEMENT: Authority – 5 USC 301. Information will be collected to enhance basic medical knowledge and aspects of clinical preventive services for research purposes only. Participation is voluntary. No rights or benefits will be affected by nonparticipation.

1. What is your pay grade?

ENLISTED

- ☐ E-1 ☐ E-6
☐ E-2 ☐ E-7
☐ E-3 ☐ E-8
☐ E-4 ☐ E-9
☐ E-5

OFFICER

- ☐ Trainee ☐ O-4
☐ W-1-W-5 ☐ O-5
☐ O-1 or O-1E ☐ O-6
☐ O-2 or O-2E ☐ O-7-O-10
☐ O-3 or O-3E

2. What is your highest level of education now?

- ☐ Did not graduate from high school
☐ GED or ABE certificate
☐ High school graduate
☐ Trade or technical school graduate
☐ Some college but not a 4-year degree
☐ Awarded 4-year degree
☐ Graduate or professional study but no graduate degree
☐ Awarded graduate or professional degree

3. How old were you on your last birthday? (Enter age) _____

4. Are you male or female?

- ☐ Male
☐ Female

5. What is your marital status?

- ☐ Married or living as married
☐ Separated and not living as married
☐ Divorced and not living as married
☐ Widowed and not living as married
☐ Single, never married and not living as married

6. Is your spouse now living with you at your present duty location?

- ☐ Yes
☐ No
☐ I have no spouse

7. Which of these categories best describes you?

- ☐ American Indian/Alaskan Native
☐ Black/African-American
☐ Oriental/Asian/Chinese/Japanese/Korean/Filipino/Pacific Islander
☐ White/Caucasian
☐ Spanish/Hispanic descent

PLEASE TURN TO THE NEXT PAGE

8. Here are some statements about things that happen to people. How many times in the past 12 months did each of the following happen to you?

NUMBER OF TIMES IN PAST 12 MONTHS

(Darken one circle on each line)

	3 or More	2	1	Never	Doesn't Apply
I had an illness that kept me from duty for a week or longer.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I didn't get promoted when I thought I should have been.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got a lower score than I expected on my efficiency report or performance rating.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for a driving violation.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for an incident not related to driving.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spent time in jail, stockade, or brig.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was hurt in an accident (any kind).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I caused an accident where someone else was hurt or property was damaged.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hit my spouse or the person I date.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I hit my child(ren) for a reason other than discipline.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got into a fight where I hit someone other than a member of my family.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife or husband threatened to leave me.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife, husband or the person I date hit me.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. The statements below are about some other things that happen to people. How many times in the past 12 months did each of the following happen to you?

NUMBER OF TIMES IN PAST 12 MONTHS

(Darken one circle on each line)

	3 or More	2	1	Never	Doesn't Apply
I had heated arguments with family or friends.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble on the job.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was involved in a motor vehicle accident while I was driving (regardless of who was responsible).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had health problems.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I drove unsafely.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I neglected my family responsibilities.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had serious money problems.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble with the police (civilian or military).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it harder to handle my problems.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had to have emergency medical help (for any reason).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got into a loud argument in public.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next group of questions is about past and current use of alcoholic beverages — that is, beer, wine, and liquor. By “liquor,” we mean whisky, rum, gin, vodka, bourbon, scotch, tequila, sake, or any other type of alcoholic beverage. Please take your time on these questions and answer each one as accurately as possible. If the answers provided are more exact than you can remember, mark your best estimate. If you can’t decide between two answer choices because you drink different amounts at different times, answer for the time you drank most.

10. During the past 30 days, on how many days did you drink beer?

- ☐ 28-30 days (about every day)
- ☐ 20-27 days (5-6 days a week, average)
- ☐ 11-19 days (3-4 days a week, average)
- ☐ 4-10 days (1-2 days a week, average)
- ☐ 2-3 days in the past 30 days
- ☐ Once in the past 30 days
- ☐ Didn't drink any beer in the past 30 days

11. During the past 30 days, what size cans or bottles of beer did you usually drink? (Beer is most commonly sold and served in 12-ounce cans, mugs, bottles, or glasses in the U.S.)

- ☐ 8-ounce can, bottle, or glass
- ☐ Standard 12-ounce can, bottle, or mug
- ☐ 16-ounce (“tall boy”) can, bottle, or mug (1/2 liter)
- ☐ Liter or quart (32-oz.) bottle or mug
- ☐ Some other size (please specify) _____
- ☐ Didn't drink any beer in the past 30 days

12. Think about the days when you drank beer in the past 30 days. How much beer did you usually drink on a typical day when you drank beer?

- ☐ 18 or more beers
- ☐ 15-17 beers
- ☐ 12-14 beers
- ☐ 9-11 beers
- ☐ 8 beers
- ☐ 7 beers
- ☐ 6 beers
- ☐ 5 beers
- ☐ 4 beers
- ☐ 3 beers
- ☐ 2 beers
- ☐ 1 beer
- ☐ Didn't drink any beer in the past 30 days

13. During the past 30 days, on how many days did you drink wine?

- ☐ 28-30 days (about every day)
- ☐ 20-27 days (about 5-6 days a week, average)
- ☐ 11-19 days (3-4 days a week, average)
- ☐ 4-10 days (1-2 days a week, average)
- ☐ 2-3 days in the past 30 days
- ☐ Once in the past 30 days
- ☐ Didn't drink any wine in the past 30 days

14. During the past 30 days, did you usually drink a regular wine or a fortified wine?

- ☐ Regular wine (also called "table" or "dinner" wine)
- ☐ Fortified wine (like sherry, port, vermouth, brandy, Dubonnet, champagne, etc.)
- ☐ Wine cooler (such as California Cooler, Bartles & Jaymes, etc.)
- ☐ Didn't drink any wine in the past 30 days

15. Think about the days when you drank wine in the past 30 days. How much wine did you usually drink on a typical day when you drank wine? (The standard wineglass holds about 4 ounces of wine. The standard wine bottle holds 750 ml).

- ☐ 12 or more wineglasses (2 bottles or more)
- ☐ 9-11 wineglasses
- ☐ 8 wineglasses
- ☐ 7 wineglasses
- ☐ 6 wineglasses (about 1 bottle)
- ☐ 5 wineglasses
- ☐ 4 wineglasses
- ☐ 3 wineglasses (about 1/2 bottle)
- ☐ 2 wineglasses
- ☐ 1 wineglass
- ☐ Didn't drink any wine in the past 30 days

16. During the past 30 days, on how many days did you drink liquor?

- ☐ 28-30 days (about every day)
- ☐ 20-27 days (5-6 days a week, average)
- ☐ 11-19 days (3-4 days a week, average)
- ☐ 4-10 days (1-2 days a week, average)
- ☐ 2-3 days in the past 30 days
- ☐ Once in the past 30 days
- ☐ Didn't drink any liquor in the past 30 days

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17. During the past 30 days, about how many ounces of liquor did you usually have in your average drink? (The average bar drink, mixed or straight, contains a "jigger" or 1 ½ ounces of liquor).

- ☐ 5 or more ounces
- ☐ 4 ounces
- ☐ 3 ounces (a "double")
- ☐ 2 ounces
- ☐ 1 ½ ounces (a "jigger")
- ☐ 1 ounce (a "shot")
- ☐ Didn't drink any liquor in the past 30 days

18. Think about the days when you drank liquor in the past 30 days. How much liquor did you usually drink on a typical day when you drank liquor?

- ☐ 18 or more drinks
- ☐ 15-17 drinks
- ☐ 12-14 drinks
- ☐ 9-11 drinks
- ☐ 8 drinks
- ☐ 7 drinks
- ☐ 6 drinks
- ☐ 5 drinks
- ☐ 4 drinks
- ☐ 3 drinks
- ☐ 2 drinks
- ☐ 1 drink
- ☐ Didn't drink any liquor in the past 30 days

19. The following list includes some of the reasons people give for drinking beer, wine, or liquor. Please tell us how important each reason is to you, for your drinking.

<i>(Darken one circle on each line)</i>	Very Important	Fairly Important	Slightly Important	Not at All Important	Don't drink
To be friendly or cool.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To forget my worries.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To relax.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To make my food taste better.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To help cheer me up when I am in a bad mood.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To help me when I am depressed or nervous.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To help me when I am bored and have nothing to do....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To reduce my chances of having heart disease.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To increase my self-confidence.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To get drunk or "high".....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Now think about your use of beer, wine, or liquor over the past 12 months and since arriving in Okinawa. The term "work day," as used in this questionnaire, refers to days when you worked at your duty station or were on quick-response (30 minutes or less) call.

20(a). The following statements describe some things connected with drinking that affect people on their work days. Please indicate on how many work days in the past 12 months these things ever happened to you.

	NUMBER OF WORK DAYS IN PAST 12 MONTHS									
	40 or More	21-39	12-20	7-11	4-6	3	2	1	None	Don't Drink
(Darken one circle on each line)										
I was hurt in an on-the-job accident because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was late for work or left work early because of drinking, a hangover, or an illness caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not come to work at all because of a hangover, an illness, or a personal accident caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worked below my normal level of performance because of drinking, a hangover, or an illness caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was drunk or "high" while working because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was called in during off-duty hours and reported to work feeling drunk or "high" from alcohol.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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20(b). The following statements describe some things connected with drinking that affect people on their work days. Please indicate on how many work days since arriving in Okinawa these things ever happened to you.

	<u>NUMBER OF WORK DAYS SINCE ARRIVING IN OKINAWA</u>									
	40 or More	21-39	12-20	7-11	4-6	3	2	1	None	Don't Drink
(Darken one circle on each line)										
I was hurt in an on-the-job accident because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was late for work or left work early because of drinking, a hangover, or an illness caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I did not come to work at all because of a hangover, an illness, or a personal accident caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I worked below my normal level of performance because of drinking, a hangover, or an illness caused by drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was drunk or "high" while working because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was called in during off-duty hours and reported to work feeling drunk or "high" from alcohol.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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21(a). For each statement below, please indicate how often you have had this experience during the *past 12 months*.

(Darken one circle on each line)

[illegible]

21(b). For each statement below, please indicate how often you have had this experience *since arriving in Okinawa*.

(Darken one circle on each line)

[illegible]

22(a). Here are some statements about things that happen to people while or after drinking or because of using alcohol. How many times in the past 12 months did each of the following happen to you?

(Darken one circle on each line)

	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Doesn't Apply
I didn't get promoted because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got a lower score on my efficiency report or performance rating because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had an illness connected with my drinking that kept me from duty for a week or longer.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours) because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for driving under the influence of alcohol.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for a drinking incident not related to driving.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spent time in jail, stockade, or brig because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My drinking caused an accident where someone else was hurt or property was damaged.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got into a fight where I hit someone other than a member of my family when I was drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife or husband threatened to leave me because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife or husband left me because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

22(b). Here are some statements about things that happen to people while or after drinking or because of using alcohol. How many times since arriving in Okinawa did each of the following happen to you?

(Darken one circle on each line)

	NUMBER OF TIMES SINCE ARRIVING IN OKINAWA				
	3 or More	2	1	Never	Doesn't Apply
I didn't get promoted because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got a lower score on my efficiency report or performance rating because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had an illness connected with my drinking that kept me from duty for a week or longer.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours) because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for driving under the influence of alcohol.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I was arrested for a drinking incident not related to driving.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I spent time in jail, stockade, or brig because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My drinking caused an accident where someone else was hurt or property was damaged.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I got into a fight where I hit someone other than a member of my family when I was drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife or husband threatened to leave me because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wife or husband left me because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next three questions ask about beer, wine, and liquor separately. Select the one answer that best describes your drinking during the past 12 months-that is, since this time last year.

23. During the past 12 months, how often did you drink 8 or more cans, bottles, or glasses of beer (3 quarts or more) in a single day?

- ☐ About every day
- ☐ 5-6 days a week
- ☐ 3-4 days a week
- ☐ 1-2 days a week
- ☐ 2-3 days a month
- ☐ About once a month
- ☐ 7-11 days in the past 12 months
- ☐ 3-6 days in the past 12 months
- ☐ Once or twice in the past 12 months
- ☐ Never in the past 12 months
- ☐ Don't drink beer

24. During the past 12 months, how often did you drink 8 or more glasses of wine (more than a 750 ml bottle) in a single day?

- ☐ About every day
- ☐ 5-6 days a week
- ☐ 3-4 days a week
- ☐ 1-2 days a week
- ☐ 2-3 days a month
- ☐ About once a month
- ☐ 7-11 days in the past 12 months
- ☐ 3-6 days in the past 12 months
- ☐ Once or twice in the past 12 months
- ☐ Never in the past 12 months
- ☐ Don't drink wine

25. During the past 12 months, how often did you drink 8 or more glasses of liquor (a half-pint or more) in a single day?

- ☐ About every day
- ☐ 5-6 days a week
- ☐ 3-4 days a week
- ☐ 1-2 days a week
- ☐ 2-3 days a month
- ☐ About once a month
- ☐ 7-11 days in the past 12 months
- ☐ 3-6 days in the past 12 months
- ☐ Once or twice in the past 12 months
- ☐ Never in the past 12 months
- ☐ Don't drink liquor

The word "installation," as used in this questionnaire, refers to your post, camp, base, station, or other geographic duty location. Navy and Marines Assigned to Ships: The word "installation" refers to your ship when in home port.

26. Please indicate how much you agree or disagree with each of the following statements.

<i>(Darken one circle on each line)</i>	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Drinking will interfere with my health or physical fitness.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The number of social events at this installation where alcohol is available makes drinking easy.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Disciplinary action will be taken against any person identified as having a drinking problem.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Driving while intoxicated on-base at this installation is a sure way to get arrested.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The military's alcohol education program has helped me make better decisions about drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Use of alcohol is against my religious beliefs.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Seeking help for a drinking problem will damage one's military career.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There are some times at work when I could use a drink.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The heavy drinking I see reduces the military readiness of my unit.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a history of alcohol dependence (alcoholism) in my family.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a history of alcohol abuse in my family.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a history of drug dependence in my family.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is a history of drug abuse in my family.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

27. Since you joined the Service, have you received professional counseling or treatment for a drinking-related problem from any of the following sources?

<i>(Darken one circle on each line)</i>	Yes	No	Have Had No Problem	Don't Drink
Through a military clinic, hospital, or other military medical facility.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Through a military counseling center or other military alcohol treatment or rehabilitation program.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Through a civilian doctor, clinic, hospital, or other civilian medical facility.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Through a civilian alcohol counselor, mental health center, or other civilian alcohol treatment or rehabilitation program.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. About how old were you when you first began to use alcohol once a month or more often? _____

- ☐ I have never used alcohol at least once a month (if it applies).

29. How often do you drive a motor vehicle within 2 hours after drinking any amount of any alcoholic beverage (beer, wine, or liquor), regardless of whether you feel any effects from the alcohol?

- ☐ All of the time
☐ Most of the time
☐ About half of the time
☐ Some of the time
☐ Hardly any of the time
☐ Never
☐ Don't drink
☐ Don't drive

30. Please indicate how much you agree or disagree with each of the following statements.

(Darken one circle on each line)	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Most of my friends drink.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drinking is part of being in the military.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Persons who try to get treatment for alcohol problems will later experience surprise searches of themselves, their auto, or their quarters.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My spouse or the person I date disapproves of my drinking (or would disapprove if I did drink).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Persons who want treatment for alcohol problems have difficulty getting time to attend counseling sessions....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drinking is just about the only recreation available at this installation.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My drinking sometimes interferes with my work.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no way to get help for a drinking problem without one's commander finding out.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
At parties or social functions at this installation, everyone is encouraged to drink.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Alcoholic beverages cost too much.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

31. The statements below are about some other things that happen to people because of using alcohol. How many times in the past 12 months did each of the following happen to you?

(Darken one circle on each line)	NUMBER OF TIMES IN PAST 12 MONTHS				
	3 or More	2	1	Never	Don't Drink
I had to be detoxified because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble on the job because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had trouble with the police (civilian or military) because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I found it harder to handle my problems because of my drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I had to have emergency medical help because of drinking.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

32. Think about the days you worked during the past 30 days. How often did you have a drink 2 hours or less before going to work?

- ☐ Every work day
- ☐ Most work days
- ☐ About half of my work days
- ☐ Several work days
- ☐ One or two work days
- ☐ Never in the past 30 days
- ☐ Don't drink

33. On work days during the past 30 days, how often did you have a drink during your lunch break?
(Answer for the main meal that occurred during your usual duty hours).

- ☐ Every work day
- ☐ Most work days
- ☐ About half of my work days
- ☐ Several work days
- ☐ One or two work days
- ☐ Never in the past 30 days
- ☐ Don't drink

34. During the past 30 days, how often did you have a drink while you were working (on-the-job) or during a work break?

- ☐ Every work day
- ☐ Most work days
- ☐ About half of my work days
- ☐ Several work days
- ☐ One or two work days
- ☐ Never in the past 30 days
- ☐ Don't drink

35. Are you now drinking more, about the same, or less than you did before you arrived in Okinawa?

- ☐ Drink more now
- ☐ Drink about the same
- ☐ Drink less now (but still drink)
- ☐ Drank before arriving at Okinawa but do not drink now
- ☐ Did not drink before arriving at Okinawa and do not drink now

36. Do you smoke cigarettes now?

- ☐ Yes
- ☐ No

37. Have you smoked at least 100 cigarettes in your entire life? (That would be 5 packs or more in your entire life).

- ☐ Yes
- ☐ No

38. Think about the past 30 days. How many cigarettes did you usually smoke on a typical day?

- ☐ About 3 or more packs a day (more than 55 cigarettes)
- ☐ About 2 ½ packs a day (46-55 cigarettes)
- ☐ About 2 packs a day (36-45 cigarettes)
- ☐ About 1 ½ packs a day (26-35 cigarettes)
- ☐ About 1 pack a day (16-25 cigarettes)
- ☐ About ½ pack a day (6-15 cigarettes)
- ☐ 1-5 cigarettes a day
- ☐ Less than 1 cigarette a day, on the average
- ☐ Did not smoke any cigarettes in the past 30 days

The next set of questions is about use of drugs for non-medical purposes. First we list the types of drugs we are interested in, along with some of their most common trade and clinical names.

DRUG TYPE	COMMON TRADE/CLINICAL NAMES
Marijuana or Hashish	Cannabis, THC
PCP (alone or combined w/drugs)	Phencyclidine (PCP)
LSD and Other Hallucinogens	LSD, Mescaline, Peyote, DMT, Psilocybin
Cocaine	Cocaine (including "crack")
Amphetamines, Methamphetamines, And Other Stimulants	Ice, crystal meth, Preludin, Benzedrine, Biphetamine, Cylert, Desoxyn, Dextroamphetamine, Dexamyl, Dexedrine, Didrex, Eskatrol, Ionamin, Methedrine, Obedrin-LA, Plegine, Pondimin, Pre-Sate, Ritalin, Sanorex, Tenuate, Tepanil, Voranil
Tranquilizers and Other Depressants	Ativan, Meproamate, Librium, Valium, Atarax, Benadryl, Equanil, Libritabs, Meprospan, Miltown, Serax, SK-Lygen, Thorazine, Tranxene, Verstran, Vistaril, Xanax

40. On the average, how often in the past 12 months have you taken each of the following drugs for non-medical purposes?

	USED THIS TYPE OF DRUG IN PAST 12 MONTHS						
	52	25-51	12-24	6-11	3-5	1-2	Never
(Darken one circle on each line)	Days or More	Days	Days	Days	Days	Days	in Past Year
Marijuana or hashish.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PCP.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
LSD or other hallucinogens.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cocaine.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Amphetamines or other stimulants.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tranquilizers or other depressants.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Barbiturate or other sedatives.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heroin or other opiates.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Analgesics or other narcotics.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inhalants.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
"Designer" drugs ("Ecstasy," etc.).....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anabolic steroids.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

41. Please indicate how much you agree or disagree with each of the following statements.

(Darken one circle on each line)	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
I can usually predict when I'm going to be selected for urinalysis testing.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would be more inclined to use drugs if the military did not have urinalysis testing.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
People in my unit would be more inclined to use drugs if the military did not have urinalysis testing.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Some people get away with using drugs because they know when they're not likely to be tested.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would not use drugs even if there were no urinalysis testing.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

PLEASE TURN TO THE NEXT PAGE

42. When did you last use each type of drug listed below for non-medical purposes?

[illegible]

43. Please indicate how much you agree or disagree with each of the following statements.

<i>(Darken one circle on each line)</i>	Strongly Agree	Agree	Disagree	Strongly Disagree	Don't Know/No Opinion
Anyone detected using marijuana should be discharged.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Education about drugs at this installation helps keep people from using drugs.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not opposed to personnel in my Service using marijuana when they're off-duty.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Most of my friends use drugs, at least marijuana.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
There is no way to get help for a drug problem without one's commander finding out.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My spouse or the person I date disapproves of drug use.....	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The next question asks about some things that affect people on their work days

44. Please indicate on how many work days in the past 12 months these things ever happened to you.

[illegible]

47. In the past 12 months, did you have any overnight hospital stays for treatment of an injury?

- ☐ Yes
☐ No

48. In general, how would you describe your health?

- ☐ Excellent
☐ Very good
☐ Good
☐ Fair or poor

49. Thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?

- ☐ 28-30 days (about every day)
☐ 20-27 days (5-6 days a week, average)
☐ 11-19 days (3-4 days a week, average)
☐ 4-10 days (1-2 days a week, average)
☐ 2-3 days in the past 30 days
☐ Once in the past 30 days
☐ Never in the past 30 days

The next questions refer to your height, weight, and general health.

50. About how tall are you without shoes on?

- | | | |
|---|---|--|
| <input type="radio"/> 4 feet, 7 inches | <input type="radio"/> 5 feet, 0 inches | <input type="radio"/> 6 feet, 0 inches |
| <input type="radio"/> 4 feet, 8 inches | <input type="radio"/> 5 feet, 1 inches | <input type="radio"/> 6 feet, 1 inches |
| <input type="radio"/> 4 feet, 9 inches | <input type="radio"/> 5 feet, 2 inches | <input type="radio"/> 6 feet, 2 inches |
| <input type="radio"/> 4 feet, 10 inches | <input type="radio"/> 5 feet, 3 inches | <input type="radio"/> 6 feet, 3 inches |
| <input type="radio"/> 4 feet, 11 inches | <input type="radio"/> 5 feet, 4 inches | <input type="radio"/> 6 feet, 4 inches |
| | <input type="radio"/> 5 feet, 5 inches | <input type="radio"/> 6 feet, 5 inches |
| | <input type="radio"/> 5 feet, 6 inches | <input type="radio"/> 6 feet, 6 inches |
| | <input type="radio"/> 5 feet, 7 inches | <input type="radio"/> 6 feet, 7 inches |
| | <input type="radio"/> 5 feet, 8 inches | <input type="radio"/> 6 feet, 8 inches |
| | <input type="radio"/> 5 feet, 9 inches | <input type="radio"/> 6 feet, 9 inches |
| | <input type="radio"/> 5 feet, 10 inches | |
| | <input type="radio"/> 5 feet, 11 inches | |

51. About how much do you weigh without shoes on? (WOMEN: If you are currently pregnant, please enter your usual weight before you became pregnant.)

PLEASE TURN TO THE NEXT PAGE

The next set of questions deals mainly with your length of service, military job, and recent duty assignments.

52. How long have you been on active duty? If you had a break in service, count current time and time in previous tours, but not time during the break in service.

53. As of today, how many months have you been assigned to your present duty station in Okinawa?

- ☐ 1 month or less
- ☐ 2 months
- ☐ 3 months
- ☐ 4 months
- ☐ 5 months
- ☐ 6 months
- ☐ 7 months
- ☐ 8 months

54. During the past 30 days, how many days were you on official leave? (Do not include overnight pass, 3-day passes, shore leave, or liberty.) _____

- ☐ Or mark this choice stating: I had no official leave in the past 30 days.

55. During the past 30 days, how many full 24-hour days were you deployed at sea? _____

- ☐ Or mark this choice stating: I was not deployed at sea in the past 30 days.

56. When was the last time you were deployed at sea for 24 hours or more?

- ☐ Never deployed at sea
- ☐ 1-7 days ago
- ☐ 8-13 days ago
- ☐ 2-4 weeks ago
- ☐ 5-7 weeks ago
- ☐ 2-3 months ago
- ☐ 4-6 months ago
- ☐ 7-12 months ago
- ☐ More than 1 year ago

57. During the past 30 days, how much of the time did you work in jobs outside your current primary MOS/PS/Rating/Designator/AFSC?

- ☐ All of the time
- ☐ Most of the time
- ☐ About half of the time
- ☐ Some, but less than half of the time
- ☐ None of the time

58. What is the ZIP code or APO or FPO number for your post, base, ship, or other duty station where you spent most of your duty time during the past 12 months? _____

59. Which of the following categories best describes your military job? (*Darken only one circle*).

ENLISTED

- ☐ Infantry, Gun Crew, or Seamanship Specialist
- ☐ Electronic Equipment Repairman
- ☐ Communications or Intelligence Specialist
- ☐ Health Care Specialist
- ☐ Other Technical or Allied Specialist

- ☐ Functional Support and Administration
- ☐ Electrical/Mechanical Equipment Repairman
- ☐ Craftsman
- ☐ Service and Supply Handler
- ☐ Non-Occupational

OFFICER

- ☐ General Officer or Executive
- ☐ Tactical Operations Officer
- ☐ Intelligence Officer
- ☐ Engineering or Maintenance Officer
- ☐ Scientist or Professional (not involved with health care)
- ☐ Health Care Officer
- ☐ Administrator
- ☐ Supply, Procurement, or Allied Officer
- ☐ Non-Occupational

60. All in all, how satisfied or dissatisfied are you with your work assignment?

- ☐ Very satisfied
- ☐ Satisfied
- ☐ Dissatisfied
- ☐ Very dissatisfied

APPENDIX B

VARIABLE DESCRIPTIONS

Appendix B

Variable Descriptions

Total consumption:

Number of beers consumed on a typical drinking day, times

beer size (normalized to a 12 ounce beer), times
number of days beer was consumed in the past 30 days], plus

Number of drinks of wine consumed on a typical drinking day, times

the type of wine (normalized to regular wine content) times
the number of days wine was consumed in the past 30 days], plus

Number of drinks of liquor consumed on a typical drinking day times

the size of the drink in ounces (normalized to 1.5 ounce drinks) times
the number of days liquor was consumed in the past 30 days].

Productivity loss, Okinawa:

Sum of the following four items taken from question 20(b):

I was late for work or left work early because of drinking, a hangover, or an illness caused by drinking.

I did not come to work at all because of a hangover, an illness, or a personal accident caused by drinking.

I worked below my normal level of performance because of my drinking, a hangover, or an illness caused by drinking.

I was drunk or "high" while working because of drinking.

Dependence symptoms on Okinawa:

Sum of the following five items taken from question 21(b):

My hands shook a lot after drinking the day before.

I awakened unable to remember some of the things I had done while drinking the day before.

I could not stop drinking before becoming drunk.

I took a drink the first thing when I got up for the day.

I had the "shakes" because of drinking.

Serious consequences on Okinawa:

Sum of the following eight items taken from question 22(b):

I received UCMJ punishment (Court Martial, Article 15, Captain's Mast, Office Hours) because of my drinking.

I had an illness connected with my drinking that kept me from duty for a week or longer.

My wife or husband left me because of my drinking. (NOTE: If this was the only item answered as "not applicable", AND the individual reported being single/never married, then the value for this variable was set at zero.)

I was arrested for a drinking incident not related to driving.

I was arrested for driving under the influence of alcohol.

I spent time in jail, stockade, or brig because of drinking.

I got into a fight where I hit someone other than a member of my family when I was drinking.

I didn't get promoted because of my drinking.

APPENDIX C

HP 2000 ALCOHOL-RELATED TARGET AREAS

Appendix C

HP 2000 Alcohol-Related Target Areas

- Reduce alcohol-related motor vehicle crash deaths*
- Reduce cirrhosis deaths
- Reduce drug-related deaths
- Reduce drug abuse-related hospital emergency visits*
- Increase the average age of first use of cigarettes, alcohol, and marijuana*
- Reduce alcohol, marijuana, and cocaine use by youth*
- Reduce heavy drinking by youth*
- Reduce overall alcohol consumption*
- Increase social disapproval of alcohol, marijuana, and cocaine use by youth*
- Increase awareness of the harmful effects of addictive substances*
- Establish better access to treatment
- Provide alcohol and drug education in schools
- Adopt worksite alcohol/drug policies
- Extend laws related to driving under the influence of intoxicants*
- Reduce minors' access to alcohol*
- Increase restrictions on promotion of alcohol to youth*
- Extend legal blood alcohol concentration tolerance levels
- Increase screening, counseling, and referral by clinicians for alcohol/drug problems
- Increase the number of States with Hospitality Resource Panels

* Items directly related to the study population

ABSTRACT

ABSTRACT

A total of 201 male subjects completed an anonymous cross-sectional survey conducted by the Naval Health Research Center, San Diego, CA. The survey was designed to study alcohol use and consequences among U.S. combat Marines deployed to Okinawa, Japan. Exactly 50% of these Marines reported heavy alcohol use defined as more than five drinks at one sitting at least once a week over the past 30 days. Mean alcohol consumption among drinkers was 143 drinks over the previous 30 days. Among drinkers, serious consequences were reported by 12.9% of the subjects and were significantly associated with total alcohol consumption ($p = .0065$) and battalion membership ($p = .0024$). Symptoms of dependence were reported by 40% of the subjects and were significantly associated with total alcohol consumption ($p < .0001$), family history of alcohol abuse ($p = .0051$), and battalion membership ($p = .0006$). Loss of work productivity attributed to alcohol use was reported by 18.7% of the subjects and was significantly associated with total alcohol consumption ($p = .0123$) and race ($p = .0449$). These data indicate significant personal and social problems associated with alcohol use in this group. These data can contribute to interventions specifically targeted at this population.